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DISSERTATIONS
ON
SELECT SUBJECTS
IN
CHEMISTRY AND MEDICINE

BY

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OF CHEMISTRY IN THAT UNIVERSITY,
AND LATE FELLOW OF NEW COLLEGE.

> Verum enimvero is demum mihi vivere atque frui animâ videtur, qui aliquo negotio intentus, præclari facinoris aut artis bonæ famam quærit. Sed in magnâ copiâ rerum, aliud alii natura iter oſtendit.
> *Salluſt.* præf. in Bell. Catalin.

> Quod ſi non hic tantus fructus oſtenderetur, ſi ex his ſtudiis delectatio ſola peteretur: tamen, ut opinor, hanc animi remiſſionem humaniſſimam ac liberaliſſimam judicaretis. *Ciceronis* Orat. pro Archia Poeta.

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TO

THE RIGHT HONOURABLE

EDWIN, LORD SANDYS,

THE FOLLOWING DISSERTATIONS

ARE HUMBLY INSCRIBED;

NOT SOLELY AS A TESTIMONY

OF RESPECT

DUE TO HIS LORDSHIP'S

EMINENT ABILITIES AND ERUDITION;

BUT AS A TRIBUTE

OF GRATITUDE,

FOR THE NUMEROUS INSTANCES

OF FRIENDSHIP AND PATRONAGE,

WITH WHICH HIS LORDSHIP

HAS HONOURED

THE AUTHOR AND HIS FAMILY.

PREFACE.

THE motives, by which an author is perſuaded to introduce himſelf to public notice, are ſometimes anxiouſly inquired after by his readers; yet in general, when known, appear to them leſs intereſting than they are repreſented by his own partial judgment. I do not eſteem it neceſſary therefore to ſay many words on this ſubject. Thoſe, who condeſcend to look into theſe treatiſes, will find in the title-page the principal ſource of my preſumption, as far as it reſpects myſelf. If they are encouraged to read farther, they may diſcern unequivocal traces, that ſelfiſh views have not entirely biaſſed me, but that I have been in no inconſiderable degree influenced by an ardent zeal for the reputation of the Univerſity, in which I have the happineſs to reſide, and for the honour of that profeſſion, with which I am connected not merely by title and degree, but, to uſe Dr Mead's expreſſion, *gentilitio quaſi Jure.* †

On theſe accounts I ſhall limit my introductory remarks to a very few obſervations, more immediately relative to the compoſition and publication of each of the following tracts.

The Inaugural Diſſertation on the Study of Chemiſtry was read before the Univerſity, when the author was nominated to the Chemical Chair. At that time the noble benefaction of the Earl of Litchfield for the eſtabliſhment of a Chemical Profeſſorſhip in the Radcliffe Infirmary had inſpired in the minds of many very reaſonable hopes, that medical ſcience, and the ſtudy of the practical as well as theoretical branches of it, might be revived with ſingular advantages in this place. With peculiar alacrity I dedicated my ſervices to the promotion of a plan ſo laudable. The members of convocation have likewiſe ſhewn a diſpoſition to ſecond and enforce the deſigns of the Profeſſors of Medicine, firſt, by an unanimous aſſent to a propoſal for ſhortening the time required for degrees in Medicine, ſo as to place the two Siſter-Univerſities, Cambridge and Oxford, in this reſpect, as nearly as poſſible, upon an equal footing; and ſecondly, by the liberal aſſiſtance, which their Delegates afforded to the Lecturer in repairing the Laboratory, and accommodating it to the purpoſes of a Chemical ſchool.

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† *Mead*, Præf. in Med. Sacr.

It is not therefore without foundation, that we feel and cheriſh a growing hope, that the ſcience of Medicine may once more flouriſh in this ſoil, and that the various ſtreams of benevolence, originally intended for its nurture and encouragement, may now be recalled to their proper channels, and employed in fertilizing that province, which they were deſtined to enrich and adorn.

This Diſſertation was received with flattering marks of attention: and as ſeveral reſpectable perſons are of opinion, that the publication of it at this time may tend ſtill farther to promote the great cauſe, which at firſt ſuggeſted the compoſition of it, I have at laſt yielded to their partial judgment. No conſiderable addition is made to the Lecture itſelf, but ſome notes are ſubjoined to illuſtrate paſſages, which might otherwiſe have appeared incorrect, obſcure, or imperfect.

THE SUBJECT of the Second Tract may not be thought ſo intereſting as the former, yet it may at leaſt afford amuſement to ſome readers, whoſe ſtudies have been directed to ſpeculations of this nature: and it may upon examination be found to have more connection with the Hiſtory of Chemiſtry, than at firſt ſight appears: for if it be thereby demonſtrated, that the Chemiſts adopted the hieroglyphic mode of writing from the Aſtronomers, it follows that Alchemy was not known, as ſome have pretended, in the earlieſt ages, nor 'till long after Aſtronomy was advanced to a conſiderable degree of perfection.

Scaliger, and after him the Preſident de Goguet have ſlightly touched upon the invention of the aſtronomical characters. In ſome points of the explanation my ſyſtem coincides with their obſervations, and may appear to have been borrowed from them: but long before I knew, that they had ſaid any thing upon this ſubject, my own theory had been formed; and it was only in conſequence of my reſearches in theſe authors, to render this tract more fit for the public eye, that I diſcovered their anticipation of a part of my plan.

I firſt gave a ſlight view of this ſyſtem in my chemical lectures, and afterwards enlarged and extended it, as an Eſſay to be read before *The Literary and Philoſophical Society of Mancheſter*, of which I had been lately elected an Honorary Member.

It is with great ſatisfaction, that I embrace this public opportunity of expreſſing my ſenſe of this honour, which I cannot but regard as a teſtimony of their approbation of the zeal I have always felt, and have ſometimes been enabled to diſplay, for the advancement of the ſciences moſt immediately connected with my Profeſſion.

This Society affords a ſtriking confirmation of the propriety of the obſervation advanced in the 75th page. The many ingenious Eſſays and Diſſertations, produced by it's members, and read at their meetings, ſhew how naturally and irreſiſtibly the latent ſparks of genius are called into action by the principle of emulation, which ſuch liberal aſſociations inſpire and ſupport; ſo true is it, as is moſt juſtly remarked in the ſhort account of this inſtitution, which has been publiſhed, "That men, however great their learning, often become indolent, and unambitious to improve in knowledge, "for want of aſſociating with others "of ſimilar talents and acquirements: "having few opportunities of communicating their ideas, they are "not very ſolicitous to collect or arrange thoſe they have acquired, and "are ſtill leſs anxious about the farther cultivation of their minds. But "Science, like fire, is put in motion "by colliſion. Where a number of "ſuch men have frequent opportunities of meeting and converſing "together, thought begets thought, "and every hint is turned to advantage. A ſpirit of inquiry glows in "every breaſt: each new diſcovery "relative to the natural, moral, or "intellectual world, leads to a farther "inveſtigation, and each man pants "to diſtinguiſh himſelf in the intereſting purſuit."

I am happy to have it in my power to add, that ſince the note, relative to the origin of the Royal Society, in the 75th page, was firſt written, the eſtabliſhment of a *Medical Society* in this Univerſity by the voluntary and active exertions of the Students of Medicine, has, at leaſt with reſpect to that branch of Science, rendered my obſervation leſs pertinent. The ſecure foundation, upon which this Society is eſtabliſhed, and the aſſiduous attention of it's Members to every thing, that can promote the intention of this laudable inſtitution, encourage a well-founded expectation, that no trifling advantages will from thence be derived to the Science of Medicine, to the Univerſity, and to the Public at large. At ſome future period, when this preſage ſhall have attained it's full completion, the remembrance of their ſucceſsful exertions will afford a ſubject for pleaſing reflection to thoſe members, whoſe induſtry and love of knowledge laid the baſis of this aſſociation,

ciation, and to myſelf, who have had the honour to preſide over and protect it's infant ſtate.

THE THIRD TRACT is a Commentary upon ſome of the accounts of the Diſeaſes prevalent in the South Sea Iſlands. It was once my intention to have made this commentary much more extenſive, but the execution of that deſign was prevented by other more neceſſary engagements. As I have no reaſon to believe it will ever be in my power to complete this plan, I give this tract with diffidence to the public in it's preſent imperfect ſtate, for which I would offer an apology, if I thought any one would be required.

The time of the appearance of the diſeaſe, which is the immediate ſubject of this Diſſertation, may appear to ſome a matter of no great importance; and certainly it is unimportant to thoſe, who in the practice of medicine have no guide, but Empiriciſm, and never extend their ideas to the hiſtorical, moral, and philoſophical principles or conſequences, ſo often combined with or dependant upon the riſe and progreſs of diſeaſes: for the hiſtory of diſeaſes is a part, not inconſiderable, of the hiſtory of human nature, and intimately connected with the progreſs of luxury, intemperance, and every deviation from the ſimple laws of the animal œconomy. And therefore, in aſcertaining the period of the firſt appearance of any diſeaſe, but particularly of one which originates from, and yet tends to annihilate, the very ſource of human exiſtence, we make one important ſtep not only in the general hiſtory of the progreſs of manners, but even in the hiſtory of the world.

Influenced by ſuch powerful conſiderations, I could not but feel at the ſame time a ſecret ſatisfaction, ariſing from theſe purſuits, though from a different principle. The inſinuations, which had been advanced to ſhew, that this calamity was an inveterate, and indeed an *indigenous*, plague amongſt theſe new-diſcovered Iſlanders, had a tendency to caſt a gloom over the more common and more pleaſing contemplation of their ſtate of ſimplicity and health, previous to the viſit of the Europeans. An attempt to efface this injurious picture, and reſtore to them, with their native, unſuſpecting, artleſſneſs of manners, the unimpaired graces of ſtrength and beauty, was a labour, which rewarded itſelf, by the ſenſations which it excited.

Having thus explained, as far as may be thought neceſſary, the principles, by which I have been perſuaded to obtrude myſelf on the public, I ſubmit myſelf to its examination, with doubt indeed and apprehenſion, yet aſſured, that, although Candour may find it impoſſible to commend the execution of my work, the motives, upon which it was undertaken, will plead ſtrongly in my favour, and, I hope, diſarm the ſeverity of Cenſure.

OXFORD, *Monday*,
April 21. 1783.

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ERRATA.

P. 14. lin. 23. for *Telleſcopes* read *teleſcopes.*
P. 24. lin. 10. after *earth* and alſo after *ſtone* inſert a comma.
P. 45. lin. ult. for *obſerſvation* read *obſervation.*
P. 151. lin. 21. for *being* read *bring.*

TRACT I.

AN INAUGURAL DISSERTATION ON THE STUDY OF CHEMISTRY:

Read in the Natural-Philoſophy School,
Oxford, May 7. 1781.

Mr Vice-Chancellor, and Gentlemen,

THE Courſe of Lectures, to which this is propoſed as an Introduction, is intended as part of a plan to revive the ſtudy of Medicine in this Place. This illuſtrious Seminary has for ages held a moſt diſtinguiſhed rank in the republic of letters; and been deſervedly celebrated, where even the firſt dawnings of Science have ſhone, as the mother of many great and eminent characters, who having ſecured by their diſcoveries or their doctrines the moſt eſſential advantages to their country and to mankind, have by the ſame labours obtained immortal fame to themſelves, and to the place of their education and reſidence. Yet in the midſt of applauſes ſo juſtly deſerved, the neglect of the ſtudy of Medicine in this place has cauſed much ſerious concern to our warmeſt friends, and afforded matter of ſevere reproach and animadverſion to ſome, who from miſinformation or miſconception have entertained prejudices againſt us. But the munificence of our late much honoured and much lamented * CHANCELLOR, and the aſſiduity of the able Phyſician, whom the Univerſity has elected to the Clinical Chair, give us room to hope, if the liberal and truly noble deſign of our illuſtrious Patron, and the attentive exertions of his firſt Profeſſor are ſupported and encouraged by a correſpondent zeal in the individual members of this place, that the period is at laſt arrived, when all theſe cauſes of cenſure on the one hand and regret on the other will be totally obviated and removed.

Senſible as I am of my own inability to execute the taſk, which I have undertaken in ſuch a manner as to lay claim to public approbation, I can only preſume to recommend my deſign to the candour of the Univerſity

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* See an extract from the will of George Henry, Earl of Litchfield at the end of a Sermon preached by the preſent Lord Biſhop of Briſtol before the Governors of the Radcliffe Infirmary, in July 1779.

verſity, and to hope that the goodneſs of the intention will plead with prevailing influence in atonement for the defects and even imperfections, which will be found both in the plan and execution of theſe Lectures.

How great theſe defects and imperfections muſt unavoidably be, will occur to every one, who conſiders the almoſt infinite extent of the Science, and the difficulty of purſuing a ſeries of experiments, amidſt the interruptions and avocations of a Profeſſion, of which the eſſential duties often require immediate attention.

The difficulties, which attend a Lecturer in this branch, will appear in a conſpicuous light from a review of the extent and utility of the Science: but before I enter upon this diſcuſſion, it may not be improper to define what Chemiſtry is, and to point out its objects.

It is not eaſy to draw up a definition of Chemiſtry, which will be intelligible to thoſe, who are entirely ignorant of the Art, as might be made to appear from an examination of thoſe definitions which have been advanced by the moſt popular writers in this Science. I ſhall only ſelect two, thoſe of Macquer and Boerhaave.

The former thus introduces his Elements of Chemiſtry, " To ſeparate the different

" ſubſtances which enter into the compo-
" ſition of a body, to examine each of theſe
" by itſelf, to diſcover their properties and
" relations, to decompoſe if poſſible ſtill
" further theſe ſeveral parts, to compare
" them, to combine them with other ſub-
" ſtances, or to reunite them and form
" again the ſame compound from which
" they were obtained, or by different modes
" of compoſition to produce new compound
" bodies of which nature has given no
" model; this is the object and principal
" aim of Chemiſtry." Tho' this definition, or rather deſcription, is certainly accurate as far as it goes, and extends to many parts of the Science, yet it is obviouſly defective if applied to the whole: becauſe there are many properties in bodies, which employ the attention of the Chemiſt, but have no relation to the elements which enter into their compoſition: nor does Chemiſtry in many of its moſt important arts ſeparate, decompoſe, combine or renew the particular ſubjects of its operation. Some of the moſt ſtriking proceſſes in metallurgy, tho' it may be imagined M. Macquer particularly alluded to this branch of the art, might be adduced as proofs of my obſervation. Pure Gold e. g. is a frequent ſubject of chemical operation

ration in the production of a great variety of ornamental works; yet in theſe and in many other caſes it undergoes no reſolution or recombination. It is not indeed with certainty admitted amongſt the facts of Chemiſtry that Gold can be decompoſed or reduced to its conſtituent parts, by the reunion of which the perfect metal may be reſtored or revived.

Boerhaave's definition, which has been ſuppoſed ſo perfect, that it has been received into ſyſtems and dictionaries of Science, is as follows:

"Chemiſtry is an art, which teaches the "manner of performing certain phyſical "operations whereby bodies cognizable by "the ſenſes, or capable of being render'd "cognizable and contained in veſſels, are ſo "changed by means of proper inſtruments, "as to produce certain determined effects, "and at the ſame time to diſcover the cauſes "thereof for the ſervice of various arts" This definition, as his Commentator well obſerves * preſuppoſes a competent number of chemical experiments already made and deſcribed. It muſt appear very obſcure and confuſed, and therefore inadequate to the

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* *Shaw's* Edition of Boerhaave's Chemiſtry, 4to Vol. II. Part II. p. 65.

purpoſe of giving the neceſſary information, to a perſon unacquainted with the art itſelf. His Commentator on this account, who from his eminent knowledge could not but obſerve this defect, is obliged to conclude, that arts can never be juſtly defined, 'till their nature, extent, and uſes are fully known: a true ſcientific definition being nothing more than a general truth or expreſſion ſumming up or including all the particulars, from whence it was derived *. It is obſervable indeed, that when eminent Artiſts or Philoſophers attempt to draw up a conciſe definition of the art or ſcience to which they have devoted their ſtudies, having a perfectly clear view of every part of the ſubject, they are apt to accommodate their definition to their own comprehenſive knowledge and capacity, rather than to the uninformed minds of thoſe who are to be inſtructed by them.

On theſe accounts it may be uſeful to take a more extenſive ſurvey of the ſcience of Chemiſtry, and to illuſtrate its object by comparing it with others to which it is nearly allied.

“ The Properties of Bodies make the “ objects of two ſciences, commonly called

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* *Shaw's* Boerhaave *ub. ſup.* Note, *a.*

“ *Natural Philoſophy* and *Chemiſtry*, which
“ are indeed in many parts ſo interwoven,
“ that perhaps no boundaries can be eſtab-
“ liſh’d between them. Yet in moſt caſes
“ they certainly admit of an eſſential and
“ important diſtinction. *Natural* or *Me-*
“ *chanical* Philoſophy, as it ſhould perhaps
“ be named with more propriety and accu-
“ racy, ſeems to conſider bodies chiefly
“ as being entire aggregates or maſſes;
“ diviſible into parts, each of the ſame ge-
“ neral properties as the whole; and as being
“ of certain magnitudes or figures, known
“ or inveſtigable, gravitating, moving, re-
“ ſiſting, *&c.* with determined forces, ſub-
“ ject to mechanic laws, and reducible to
“ mathematical calculation. *Chemiſtry* con-
“ ſiders bodies, as being compoſed of a
“ particular ſpecies of matter, diſſoluble,
“ liquefiable, vitreſcible, combuſtible, fer-
“ mentable, and impregnated with colour,
“ ſmell, taſte, &c; or conſiſting of diſſimilar
“ parts, which may be ſeparated from one
“ another or transferred into other bodies.
“ The properties of this kind are not ſubject
“ to any known mechaniſm, but ſeem to be
“ influenced by laws of another order. Thus
“ Natural Philoſophy inveſtigates the ob-
“ vious external and general properties of
the

" the Air, Fire, Water, Heat, Cold, Moi-
" ſture, Wind, *&c.* by various experiments,
" made with the air-pump and other ſuit-
" able inſtruments: but it is the buſineſs
" of philoſophical Chemiſtry more intimately
" and eſſentially to examine the internal na-
" ture, ſtructure, compoſition, operations, and
" relations of theſe Elements; and thence
" it finds modes of applying them as en-
" gines and inſtruments of buſineſs either
" ſeparately or in co-operation with thoſe
" ſolvents or menſtrua, which have always
" been conſider'd peculiarly as chemical
" agents *."

This illuſtration, which points out the exact limits of theſe two branches of ſcience, and particularly ſhews, that in the paſſage above cited from M. Macquer, Chemiſtry is but partially and imperfectly defined, will ſerve alſo to introduce a Definition more accurately correſpondent to the principles of diſtinction here laid down.

A celebrated Profeſſor in a Northern Univerſity defines Chemiſtry to be a *Science, which teaches by experiments the effects of heat and mixture on bodies:* a definition, which will be found more truly applicable and comprehenſive, than any which has hitherto been propoſed.

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* *Lewis*, Comm. Phil. Tech. Preface.

The extenſive utility of the ſcience thus defined, is ſhewn by its immediate connection with almoſt all the arts in any degree ſubſervient, not only to the comfort, but almoſt to the very ſubſiſtence of civilized life. In that important buſineſs of making bread; in the arts of dying, tanning, painting; in the manufactures of glaſs, porcelain, and enamel; in the preparation of artificial ſtone, and the various kinds of cement; the imitation of gems; the preparation and refinement of ſalts and ſugar; the extraction of metals from the ore; the invention of compound metals, and the diſcovery of the ſeveral modes by which metallic ſubſtances may be applied to mechanical, culinary, or ornamental uſes; the influence of Chemiſtry is ſufficiently obvious. To the ſame ſource we may impute many of the principal improvements of modern Agriculture, the regulation of the putrefactive proceſs for the preparation of manure, the inveſtigation and detection of the beneficial qualities of alkalis, neutral ſalts, and ſome ſpecies of earth. Theſe advantages are ſeen in a more extenſive view, when we contemplate the numerous products obtained in the different proceſſes of diſtillation and fermentation. In this enumeration of the benefits, which have been introduced into civilized life by Chemiſtry, it would be unpardonable in one who propoſes this courſe of lectures, as part of a plan for the promotion of the ſtudy of Medicine, to omit the mention of the great improvements, made by its union with Chemiſtry, both in the theory and practice of that Science. The nature and deſign of this undertaking will apologize for a more extenſive excurſion on this part of the ſubject.

Many of our moſt active Medicines are chemical preparations, equally unknown to the ancient inhabitants of Europe, and to the modern poſſeſſors of the uncivilized parts of the globe. The acquiſition of theſe medicines, the diſplay of their virtues, and the application of theſe properties to the relief of the calamities or infirmities of human nature, we owe entirely to the perſeverance of the Chemical ſect of Phyſicians. Their adverſaries, who could not deny their pretenſions to diſcoveries of ſuch indiſputable importance, contented their malice by aſcribing theſe great proofs of indefatigable labour, in ſome inſtances directed by real genius,

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nius, to accident and the favour of fortune alone: not recollecting, that even accidental diſcoveries are not made in Chemiſtry without almoſt inceſſant attention and fatigue. Theſe inquiries, eſpecially when the ſphere of the application of this ſcience became enlarged, required, if I may uſe the expreſſions of a very elegant Writer on this ſubject *, "an uninterupted attention of mind, "and the conſtant weariſomneſs of bodily "labour:" and theſe artiſts perhaps thought themſelves in no ſmall degree ſucceſsful, if their exertions of mind and body were even caſually rewarded by a diſcovery, which might ultimately contribute to the advantage of mankind.

By the experiments of the Chemiſts we have obtained a more accurate idea of the formation, compoſition, and qualities of the blood and the ſecreted fluids of animal bodies. By the ſame we have acquired a more intimate knowledge of the proceſs of reſpiration, and of the nature of the fluid diſcharged from the lungs with the breath: and thus the phyſiology and pathology of an organ ſo neceſſary to life have been greatly improved. By the progreſſive advancement of Chemiſtry,

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* *Watſon*, Eſſay I. Vol. I. p. 40.

Pharmacy, a moſt eſſential branch of the medical art, as it directs the preparation and compoſition of natural or artificial ſubſtances for medicinal purpoſes, has already received, and daily receives, proportionable illuſtration and advancement; and in this country eſpecially has been reſcued from a ſtate, which was a ſcandal to the good ſenſe of a nation, where the liberal arts were cultivated, and is now reduced to a judicious, conciſe, and elegant ſyſtem *. To theſe obſervations we may add, that by the application of Chemiſtry we are making a daily progreſs in the inveſtigation of the cauſes of epidemic diſeaſes; and as we advance in the knowledge of their cauſes, it is but reaſonable to hope we ſhall gradually diſcover and bring to perfection thoſe means, by which their violence may be mitigated, and perhaps their frequent recurrence prevented. Theſe diſeaſes often ſpread devaſtation thro' extenſive countries, over people of all ranks and orders, without being in their own nature infectious. That they cannot be imputed to any particular mode of living is obvious, becauſe in thoſe who are attacked with the evil, the mode of life is infinitely various. There muſt

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* *Gregory*, Comp. View, Vol. I. p. 127.

therefore exiſt ſome more general cauſe, moſt probably impregnating or influencing the atmoſphere, which alone is common to all ranks of people. For a long ſeries of years obſervations have been made on the ſenſible qualities of the atmoſphere, relative to its weight and temperature; and theſe have been compared with the recurrence of epidemic diſeaſes, but ſtill we have not obtained a complete explanation of the phænomena. The inquiries of modern Chemiſts have been directed to the examination of its more hidden qualities, by an analytic inveſtigation of its conſtituent parts[*]. The progreſs which has been made in this new path promiſes much real, much applicable information on a ſubject moſt immediately connected with the preſervation of the firſt of all bleſſings, Health.

If after this ſurvey of ſome of the principal circumſtances, which have contributed to the convenience and elegance of domeſtic life in the European, and ſome of the Aſiatic nations, we turn our thoughts to the contemplation of the miſerable ſtate of the uncivilized tribes, who reſide in the interior regions of North America, Tartary, or the new diſcover'd iſlands in the South Seas, where theſe ſciences and all their advantageous effects are unknown, we may be taught by the contraſt to value and to cheriſh thoſe arts, from which our ſuperiority in civilization has been derived, and excited to uſe our utmoſt endeavours to tranſmit them down to our poſterity with improvement, and to communicate them to nations yet uninformed, that the benefits which we enjoy may become univerſal.

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[*] See *Bergman's* Preface to *Scheele's* Treatiſe on Air and Fire, *Forſter's* tranſlation P. xxi.

While Chemiſtry has contributed ſo largely by the invention of theſe ſubordinate arts to the more commodious ſubſiſtence of the human ſpecies, it has lent its aid in many inquiries of a more important nature, which have contributed moſt eſſentially to the propagation of happineſs by diffuſing wide the inſtructions of Hiſtory and the conſolations of Religion.

It may be remarked, that to the uſe and application of glaſs in the conſtruction of telleſcopes, mirrors, and optical inſtruments we owe the enlargement of our ideas concerning the Author of nature, and thoſe ſtupendous laws, which regulate the ſyſtem of the Univerſe, ſo perſpicuouſly diſplayed by the ſublime diſcoveries of Galileo and Newton. Thus the ſciences of Aſtronomy and

Optics have been, and not remotely, indebted for their preſent eminent advancement to the labours of Chemiſtry. But in this place I more particularly allude to the inventions of Writing and Printing. The materials, by which theſe arts are carried on, are obviouſly of chemical production, and their progreſſive improvement to their preſent ſtate of perfection has been derived from the ſame ſource.

Some writers fond of maintaining paradoxical opinions, and lamenting the vices of their own times, which even Learning has been too often proſtituted to encourage and foment, have expatiated with rapture on the happineſs of thoſe ages, when the uſe of letters was unknown. They have ſuppoſed, that the contagious influence of vicious example, if it exiſted at all, acted but in a ſmall ſphere, and ſoon expired from the defect or abſence of thoſe corrupt ſources of ſupply, by which it has been propagated in later periods and in modern ſtates, which we affect to call civilized. But it is probable from a more intimate acquaintance with the real condition and modes of life of thoſe numerous *hordes*, which reſide in the interior regions of Tartary, and America, that all theſe ideas of the exiſtence of a pure morality in countries, where the uſe of letters is unknown, exiſt only in viſionary and enthuſiaſtic imaginations. The defects of traditional knowledge, the only ſpecies which can be conceived to ſubſiſt in ſuch a ſtate, are viſibly diſplayed in thoſe wild inventions, which disfigure the early pages of ancient hiſtory; where religion and impiety, morality and vice, are blended together in the moſt abſurd fictions, and every exceſs and extravagance is countenanced, recommended, and enforced by the example of Heroes and Deities.

By the arts of Writing and Printing all the refined pleaſures of ſocial life have been advanced to the higheſt pitch of improvement. It will naturally occur to a reflecting mind, how much the important intereſts of Religion have been extended and ſecured by theſe arts, as by the multiplied copies of the Sacred Writings, the hiſtory of Revelation, the ſublimity of its doctrines, the purity of its precepts, the conſolation of its rewards, the terror of its judgements, have been propagated to the moſt diſtant regions, and perpetuated to all ages. We may add too, that by theſe means alſo have the elegant productions of genius in former periods been delivered down to us; and thus we are taught to feel a portion of that inſpiration which animated the ſages and poets of antiquity. And even thoſe perſons of more obſcure ſtation, to whom the philoſophic, hiſtoric, or poetic page of antiquity has never been open'd, will ſtill acknowledge the extenſive utility of the arts we are now contemplating, when they recollect, that by theſe the negotiations of trade are conducted, and that to theſe we owe the ineſtimable ſatisfaction, which ariſes from a reciprocal communication of the ſentiments of friendſhip in epiſtolary correſpondence.

The Chemical arts indeed have in a moſt eſſential manner contributed to the promotion of Navigation and Commerce. Thus the ſecret treaſures of diſtant nations have been laid open and interchanged; the poverty of one country has felt the beneficial influence of the fertility of another; the ſtores of the Materia Medica, the means of preſerving or reſtoring health, have been enlarged, and every comfort of domeſtic life has received ample augmentation. And in this general circulation of benefits, Chemiſtry has itſelf experienced a proportionable increaſe of its reſources in a large ſupply of materials for future operations, from whence new and unexpected products are daily obtained, and ſucceſſive improvements in various manufactures and in medicine ſuggeſted and promulged.

While Chemiſtry has thus brought to light, and advanced to perfection, thoſe various inventions, by which human life is render'd more commodious and more poliſhed; it has pointed out the means, by which theſe advantages may be render'd ſecure to to the poſſeſſor, and defended from the unjuſt invaſions of avarice and tyranny.

The natural paſſions of men, inflamed by ambition or ſtimulated by neceſſity, in very early times taught the uſe of Arms. It is moſt probable, that the weapons of offence or defence, employed in the early ages, were no leſs rude than thoſe, which are now uſed by nations little advanced in the arts of civil life. But the diſcovery of a method of extracting iron from its ore, and forging inſtruments of greater ſtrength and execution, very ſoon ſuperſeded theſe rude inventions.

It is not my buſineſs to enter into a hiſtory of the art of war. It is a melancholy detail of tranſactions, which ſhew on the one hand the dreadful effects, reſulting from the violence of unreſtrain'd ambition, and the indulgence of malignant paſſions; but on the other hand exhibit wonderful examples of intrepidity, patience, perſeverance, generoſity, and every other ſublime virtue. This art, which the diſcovery of iron contributed only to render more extenſively calamitous, was by another chemical invention reduced to a milder ſyſtem. The uſe of Gunpowder has totally changed the mode of conducting war, and at the ſame time, that it has render'd policy and conduct more prevalent than brutal courage, it has contributed greatly to mitigate and ſoften this ſcourge, ſo deſtructive to the human race. Battles are now rarely diſtinguiſh'd by that dreadful carnage, which ſtained the plains of Cannæ and Pharſalia: and the influence of a milder Religion having inſpired a milder ſyſtem of morals, war has been converted, amongſt civilized nations, by all theſe concurrent cauſes from an offenſive to a defenſive inſtitution *.

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* Dr. *Lettſom* in his learned and very entertaining hiſtory of the Origin of Medicine, mentions amongſt other cauſes, which prevented the progreſs of Surgery in the early ages, that no attention was then paid to captives in battle tho' wounded, who were conſider'd as the ſlaves of the conqueror. He gives many inſtances of this inhuman mode of treatment, and particularly remarks, that an exchange of priſoners was never thought of: " ſo that " one of the moſt likely means," he adds with equal ſenſibility and diſcernment, " of promoting the knowledge of " Sur-

From the whole of this review of the advantages derived to mankind from the improvement of the ſcience and art of Chemiſtry, (in which however many particulars have been but lightly touched, and many entirely omitted,) it will appear how much this ſcience and the arts dependent upon it, have contributed to the civilization of life. And at the ſame time that it has made it more commodious and more deſirable, it has ſupplied the means of protection and defence, whereby nations, and every individual poſſeſſor of theſe bleſſings, are enabled in peace and ſecurity to maintain their poſſeſſions inviolate.

This diſplay of the infinite advantages, which mankind have derived from Chemiſtry, cannot but excite a curioſity, in thoſe to whom they are diſplayed, to learn the ſteps by which the ſcience has gradually advanced to that perfection, which it at preſent

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" Surgery, and the offices of humanity, was thus in a
" great meaſure precluded. Indeed the mode of making
" war among the ancients was no leſs inhuman than fatal.
" It is the invention of fire arms, that hath prevented the
" deſtruction of the human ſpecies, and at the ſame time
" contributed more to the eſtabliſhment of ſcience, than
" any diſcovery except the mariner's compaſs." *Lettſom's* Oration on the origin of Medicine p. 37.

ſent boaſts. I ſhall therefore in the next place give as brief an account as I can of the principal events and revolutions in its hiſtory.

The ancient hiſtory of Chemiſtry, like that of nations, is involved in obſcurity, and perplexed with fabulous inventions. The lovers of this ſcience, impreſſed with a high ſenſe of its importance, have deemed its exiſtence and cultivation co-eval with mankind. Some of its moſt ſanguine votaries, not finding in the annals of thoſe early periods traces of general knowledge adequate to diſcoveries of ſo ſublime a nature, have attributed its invention to the immediate interpoſition of the Deity, and aſcribed the operations of Tubal-Cain, (who, as we are told in Scripture *, diſtinguiſhed himſelf ſoon after the fall of man by his works in braſs and iron,) to direct inſpiration from Heaven. The ancients, they ſay, ſenſible equally with themſelves of the extent of his ſkill in metallurgy, ſo far exceeding that of all his contemporaries or predeceſſors, conceived him to be one of the Gods, and paid him divine honours under the name of

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* Geneſis iv. 22.

Vulcan *. It muſt be confeſs'd, that the extraction of iron and copper from the ore

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* Nor was this the only mode of inſpiration, by which this art was ſuppoſed to have been firſt communicated to mankind. Many of the alchemical writers have aſſerted that when the Dæmons, the fallen Angels, ſaw the daughters of men, they were enamour'd of their beauty, and obtained the gratification of their deſires, by revealing to them the doctrines and proceſſes of this *ſacred* art. The curious reader will find in *Dr Shaw's* Edition of *Boerhaave's* Chemiſtry, V. I. p. 8. a ſatisfactory abſtract from the writings of *Zoſimus*, *Clemens Alexandrinus*, and *Borrichius* relative to this extraordinary ſubject. Frivolous and abſurd as this opinion may now perhaps juſtly be thought, we are obliged to it for ſome very beautiful paſſages in the *Paradiſe Loſt* and *Regained*; particularly B. 3. 463, B. 5. 446, B. 11. 580, and 613, and *Par. Reg.* B. 2. 175. In ſome of theſe paſſages Milton adopts the tradition of an intercourſe between the fallen angels and the daughters of men: in others he confines himſelf ſtrictly to the more plauſible interpretation of that text of ſcripture, which has been made the baſis of theſe ſtrange conjectures (ſee Gen. 6. 2.) It is moſt probable, that by the appellation of the *Sons of God* were deſigned a ſelect race of men, the deſcendants of Seth, who for a time preſerved themſelves pure and uncorrupted worſhippers of the true God; but were at laſt ſeduced to idolatry by the alluring beauties of of the daughters of Cain.

The hiſtory of Vulcan is not leſs obſcure and difficult of explanation, than that of the other heathen deities. *Borrichius*, unable to reconcile the various doctrines advanced on this point, is obliged to aſſert, that there were four perſons of this name, who were deified by the ancients. 1ſt the Tubal-Cain of the Scriptures. 2dly Canaan, the youngeſt ſon of Cham, whoſe elder brother Mizraim he ſuppoſes to have been the Hermes or Mercury of the Ægyptians. 3rdly a ſon Jupiter and Juno. 4thly a perſon of much later date, by birth, if I recollect right, a Mænalian, and afterwards king or lord of the iſles, from him

called,

is, even at preſent, one of the moſt difficult operations of metallurgic Chemiſtry: and hence we are reaſonably led to form no mean ideas of the ſkill of the artificer, who firſt effected

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called, Vulcanian. He readily gives up Tubal-Cain, and ſuppoſes, that all the attributes and qualities, generally aſcribed by the heathen world to Vulcan, ſhould be referred to Canaan, whom he attempts to prove the Ægyptians regarded as the God of Fire. From the inſtructions of himſelf and his brother Mizraim, he informs us, they derived all their knowlege in Chemiſtry and Natural Philoſophy, which he is willing to inſinuate was ſo extenſive, that ſubſequent diſcoveries have added little to it. Hermes the ſecond, whoſe Ægyptian title, expreſſive of his greatneſs and knowledge, the Greeks tranſlated Triſmegiſtus, was poſterior to theſe, and derived his celebrity from the illuſtration of the works of the firſt Hermes, and the wholeſome laws and inſtitutions, which he enacted. In defence of the erudition of the Ægyptians Borrichius is ſo ſtrenuous an advocate, that he will not relinquiſh the ſmalleſt point to his opponents. His arguments, tho' perhaps they may not convince, may very much amuſe, an inquiſitive reader. See his work *De ortu. et progr. Chem.* p. 50 to 76. edit. Hafniæ. 1668. I cannot conclude this ſubject without obſerving, that whatever foundation there may be for any of theſe opinions concerning Vulcan; that which contends for the identity of this Deity and Tubal-Cain has ſcarcely any other ſupport, than a ſlight reſemblance, in ſome languages, in the ſound or termination of the two names. The ſtory of Vulcan, whoever was the perſon who acquired the honour of an apotheoſis under that title, or whether any ſuch perſon ever exiſted or not, ſeems to have ſome connection with the traditions concerning the War in Heaven and the expulſion and fall of the Rebel Angels: Homer in the firſt Iliad repreſents him, adviſing Juno to appeaſe the anger of Jupiter by ſubmiſſion and acquieſcence from his own experience of the dreadful effects of the excited wrath of that Supeme Power: and he then deſcribes his expulſion from heaven, this laborious proceſs. Our opinion of this difficulty, and conſequently of the great extent of Tubal-Cain's knowledge, is farther increaſed by a doctrine, which ſtill prevails in many works on metals and minerals, "*mineralia tendere ad metalla, metalla ad perfectionem*;" that is, that all mineral ſubſtances are in a progreſſive ſtate, advancing from the moſt crude and imperfect mineral, earth or ſtone by the gradual operation of nature to a metallic form, and ſtill onwards thro' the leſs perfect forms of metals to the condition of that, in which all the diſtinguiſhing qualities are united, Gold *. This

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heaven, when on a former occaſion, either in defence of herſelf or ſome other Deity, he had dared to oppoſe the authority of Jupiter, which none ever reſiſted with impunity.

Μητρι δ' εγω παραφημι, και αυτῃ περ νοεουσῃ
Πατρι φιλῳ επιηρα φερειν Διϊ, ὀφρα μη αυτε
Νεικειῃσι πατηρ, συν δ' ἡμιν δαιτα ταραξῃ·
Ειπερ γαρ κ' εθελῃσιν Ολυμπιος αστεροπητης,
Εξ ἑδεων στυφελιξαι· ὁ γαρ πολυ φερτατος εστιν.

Iliad. α. 577.

And below:

Τετλαθι, μητερ εμη, και ανασχεο κηδομενη περ,
Μη σε, φιλην περ εουσαν, εν οφθαλμοισιν ιδωμαι
Θεινομενην· τοτε δ' ουτι δυνησομαι, αχνυμενος περ,
Χραισμειν· αργαλεος γαρ Ολυμπιος αντιφερεσθαι.
Ηδη γαρ με και αλλοτ' αλεξεμεναι μεμαωτα,
Ῥιψε, ποδος τεταγων, απο βηλου θεσπεσιοιο.

Id. 586.

* Traces of this doctrine are to be found in almoſt all the alchemical writers, whoſe works are intelligible: but

opinion was dictated by an attachment to the theories and purſuits of alchemy; and is perhaps more agreeable to theſe than to truth and nature. If this alchemical doctrine were true, ſpecimens of native metals or even of metals in the various ſtages of their progreſſive ſtate would not be ſuch rare occurrences as they are. I am induced to believe, that the inverſe of the abovementioned poſition is the truth; and that metals were in the earlier ages much more fre-

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I deem it needleſs to refer to theſe, when I can produce the authority of much later and more perſpicuous chemiſts. See *Beccheri* Supplement. Secund. in Phyſicam Subterrerraneam, Theſin 2ndam, de ſubjecto tranſmutationis metallicæ. " Præcedens theſis demonſtravit poſſibilitatem et " neceſſitatem tranſmutationis metallicæ; nunc hâc theſi, " qualiter illa contingat examinabimus, atque ita de ſub- " jecto tranſmutationis metallicæ agemus. Cum vero " natura ſemper intendat perfectius, etiam illam ſuum or- " dinem circa tranſmutationem metallorum obſervare cre- " dibile eſt. Statuemus ergo, naturam omnia corpora " metallica in aurum deducere velle; etiam deducturam, " ſi non impediatur." &c. &c.

See alſo *Stahlii* Specimen *Beccherian.* Part. I. Sect. II. *Memb.* 4. *Theſ.* 4. where the doctrine is carried much farther, and extended to all ſubterraneous bodies, the theſis propoſed being, " *Subterranea* tendunt ad metal- " leitatem; metalla ad perfectionem." The defence of this theſis begins thus, (by which we perceive that *Stahl* did not entertain a doubt concerning the truth of the poſition.) " Eſt hæc authoris noſtri hinc inde indigitata aſſer- " tio; cui ſicuti velut univerſa alchymiſtarum antiquitas " pollicem premit." &c. &c. &c. Though he afterwards makes ſome attempts to modify and limit the doctrine.

quently found native, or very rarely and ſlightly combined with thoſe ſubſtances, with which we now find them mineralized, and which render the extraction of them from the ore ſo difficult. When we conſider how many ſolvents of metallic ſubſtances are every where preſented in the bowels of the earth, and reflect how ſoon any of the metals, except gold, ſilver, and platina, expoſed to the action of ſubterraneous ſteams and vapours, are corroded and even diſſolved, we ſhall rather imagine, that we ſee nature acting in an oppoſite mode; and be led to ſuppoſe, that metals were originally formed in a ſtate much nearer to that which we call perfect, and that their purity has been gradually diminiſhing by the action of thoſe ſubſtances, which are now the media of their mineralization. If this opinion can be admitted, the works of Tubal-Cain may be deemed leſs difficult, than upon the common ſuppoſition we have been induced to believe them.

From this inſpiration of the firſt artificer in chemical works, whoſe name ſtands upon record, the art, if we believe the ſuggeſtions of partiality and enthuſiaſm, advanced quickly to the utmoſt degree of perfection in the antediluvian world: And the valuable ſecrets, which its numerous profeſſors and votaries had revealed, were preſerved with anxious care by the ſons of Noah, when every trace of other ſciences was obliterated in the univerſal calamity of the deluge, and were particularly cultivated and taught to his deſcendants by Cham, whoſe poſterity ſettled in Palæſtine and Ægypt. * From him, it is aſſerted, the name of the art itſelf *Chamia* or *Chemia* is derived. The proverbial celebrity of the Ægyptians in general ſcience, and in many of the arts immediately connected with Chemiſtry, in dying, gilding, in ſome metallic works, and in the embalming of bodies, † ſeems to give a good

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* Hiſt. de la Philoſoph. Hermet. par. *L'Abbé Lenglet du Freſnoy*. Vol. I. p. 7. Sect. IV.

† Alluſions to the wiſdom of the Ægyptians, and proofs of their proficiency in theſe arts, at leaſt in the time of Moſes, are very frequent in the Old Teſtament, particularly in the following paſſages. *Geneſ.* 41. v. 42. *Id.* 50. v. 2, 3, 26. *Exod.* 25. v. 11, 31, 36. *Id.* 28. throughout. *Id.* 12. v. 35. *Id.* 31. v. 3,4,5. *Id.* 32. v. 4. *Id.* 35. throughout: to which may perhaps be added 1 *Kings*. 4. v. 30.

To theſe teſtimonies concerning the ſkill of the Ægyptians we may add that of Homer, tho' it muſt be acknowledged, that according to every ſyſtem of chronology ſome hundred years elapſed between the times of the patriarch and the poet, yet the paſſage ſhews, that many of the ornamental arts connected with Chemiſtry had been long practiſed in Ægypt. The paſſage I allude to is the account of the preſents made to Menelaus and Helen by the king of Thebes and his wife, conſiſting of elegantly foundation for ſuch an opinion. An argument ſuppoſed irrefragable in confirmation of theſe conjectures is adduced from the ſcriptural account of the deſtruction of the golden calf by Moſes, who is expreſſly ſaid,[*] to have been learned in all the wiſdom of the Ægyptians. Much time and much learning have been expended very fruitleſſly on the illuſtration of this piece of ſacred hiſtory. It has been generally produced as a demonſtration of the flouriſhing ſtate of Chemiſtry in Ægypt, as it is thought to prove, that they were not unacquainted with the method of diſſolving gold. But it has been juſtly remarked, by a very elegant and ingenious Writer,[§] that the expreſſions of Scripture, in either of the paſſages, where this fact is recorded,[†] do not authorize us to

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wrought veſſels of gold and ſilver. Odyſ. δ. 125 et ſeq. Perhaps in many of theſe paſſages, the terms properly underſtood will not be thought to imply ſuch an extenſive and univerſal knowledge of Chemiſtry in Ægypt, as the advocates for this opinion are willing to ſuppoſe. Conjectures might be advanced on this ſubject, but I think it better to let theſe deſcriptions have their full force. Yet it may be obſerved, that in all theſe paſſages or the books from which they are taken, we find very rarely any mention made of iron or braſs; from whence it ſhould appear that the operations on theſe metals were not brought to any great perfection. The accounts too of their dying and colouring are extremely general.

[*] *Acts* 7. v. 22.

[§] Watſon's Chemical Eſſays. Vol. I. p. 10.

[†] *Exod.* 32. v. 20. *Deuteron.* 9. v. 21.

ſay, that Moſes made an actual *ſolution* of the gold. We are ſimply told, "that he "took the calf, which they had made, and "burnt it in the fire, and ground it to pow- "der, and *ſtrawed it upon the water*, and "made the children of Iſrael to drink of it." And ſecondly, ſuppoſing the ſolution to have been as perfect, as could have been effected by the proceſs of Dr. *Stahl*, which ſome have called in to their aid, is it in any degree a proof of the general proficiency of the Ægyptians in Chemiſtry, that One Man, diſtinguiſhed by the peculiar favour of Heaven, and led by the viſible hand of the Deity; One, who had not long before, to diſcountenance and counteract the rebellious diſpoſition of his tribes (by giving evidence of the ſupernatural powers, with which the Almighty had endued him) divided the ſea for their paſſage, and called forth water from the rock to relieve their thirſt; that this One Man ſhould effect a phænomenon, to them perhaps equally new and extraordinary, the ſolution of gold? Is not the very mention of it rather a proof, that it was effected by no proceſs generally known, by no common power or knowledge?

We may leave therefore to the Ægyptians, and their neighbours the Tyrians and Phænicians,

nicians, the credit of the arts for which they are ſo celebrated: we may even permit the vanity of antiquarians in ſcience to expatiate on the inventions of the fabulous ages, the diſcoveries of Hermes, and the wonderful Arcana revealed only to thoſe who were initiated in the Ægyptian myſteries; but with all reaſonable indulgence to their credulity, we cannot allow theſe ideal fancies to uſurp the place of truth. It will appear moſt probable, if we attend with due diſcrimination to the few authentic evidences which can be collected from ancient hiſtory, that Chemiſtry (tho' many of the arts dependant upon it were not unknown to the antediluvian world, to the Ægyptians and Tyrians ſince that period, and ſtill more lately to the Greeks and Romans) was little more than a collection of ſome few proceſſes, neceſſary to life or ſubſervient to luxury; but was never conſidered in one comprehenſive view, or cultivated as a ſcience, previouſly to thoſe ages, which we deem modern. The ancients probably knew not even the name of Chemiſtry, tho' ſo much has been written concerning the word χημεια, which ſeems rather to have been derived from the name of a diſtrict, or perhaps of the whole of Ægypt applied originally from ſome peculiar appearances of its ſoil, and borrow'd afterwards at a very diſtant period of time to diſtinguiſh an art, which was conceived to have had its riſe and principal cultivation in that country. Plutarch calls Ægypt, χημια, * but without any reference to the arts for which it was celebrated. It may be added that we find no clear alluſions to it in the claſſical authors, tho' its doctrines and diſcoveries would have afforded ample ſcope for the exerciſe of the faculties of the imagination, and the powers of deſcription. From all that has been advanced concerning the riſe and progreſs of Chemiſtry, perhaps it may be thought not unreaſonable to believe, that the art owes its origin to the neceſſities of mankind in the earlieſt ages. Some painful or pleaſing impreſſion, excited by ſurrounding objects, called the attention of men to the examination of the properties of particular bodies, which chance had preſented: and the ſenſe of ſome craving want ſuggeſted the means of applying thoſe properties to uſe. It was very long however before the ſtock of chemical facts. thus ſlowly accumulating, afforded materials for

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* Ετι την Αιγυπτον εν τοις μαλιστα μελαγγειαν ουσαν ωσπερ το μελαν του οφθαλμου Χημιαν καλουσι.

Plutarch. Iſ. & Oſir. *Squire's* Edit. Sect. 33.

that compariſon of facts and their relations, which we call Science. The principles of many branches of the art, and therefore thoſe branches themſelves, are neceſſarily coexiſtent with mankind; but the ſcience of Chemiſtry was entirely unknown to the ancient world.

In purſuing this hiſtory, I do not think it neceſſary to detain you with an account of what has been related of the proficiency of Pythagoras and Democritus * in this art, particularly in the imitation of gems, with which the latter has been ſaid to have been intimately acquainted. It is not improbable, that by accident he had diſcovered a proceſs, by which a glaſſy compoſition might be formed, and had learned, equally by accident, a mode of tinging it of various colours. Even this degree of knowledge, if ſupported by proper aſſiſtances

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* The *Abbé Lenglet du Freſnoy*, in his 1ſt Vol. of the Hiſt. de la Philoſ. Hermetique, cites the following teſtimonies of the chemical knowledge of Democritus, "Itaque, inquit, omnium herbarum ſuccos Democritus expreſſit, et ne lapidum virgultarumque vis lateret, ætatem inter experimenta conſumpſit.

Petron. Arbiter in Satyrico.

Hic etiam doctiſſimus fuit Democritus: primus enim liquandi lapides, fingendi ſmaragdos, et quemlibet infundendi colorem, rationes invenerit. Ebur emollire noverat, aliaque innumera. *Seneca* Lib. 14. Epiſt. 91.

Du Freſnoy Hiſt. Vol. I. p. 29.

of myſtery, which are rarely deficient in the philoſophical experiments of rude and uninformed periods, would have attracted no ſmall admiration, when the art was in its infant ſtate. It is not eaſy to rely with much confidence on any accounts, which the ancients have given of his farther progreſs. The language of admiration is not always the language of truth, becauſe admiration is often the offspring of ignorance.

The hiſtory of Chemiſtry affords but little inſtruction or amuſement, 'till we come to the æra of ALCHEMY.

This is an Arabian title given to a moſt extraordinary ſcience, by which it was ſuppoſed that a few perſons, who from their wonderful acquiſitions were called, *Adepts*, could tranſmute all metals into gold, could prepare an univerſal ſolvent, and compound a medicine, capable not only of reſtoring health, but even of perpetuating life.

The principal object of this Mania for many ages was the art of making gold. For a great length of time, it employed only the ſpeculation of a few curious perſons, ſo buried in retirement and loſt in obſcurity, that there is almoſt reaſon doubt, whether the perſons, whoſe names are delivered down to us, ever exiſted. Some authors aſſert, that ſo early as the third century of the Chriſtian æra, the emperor Diocleſian iſſued an edict for burning all the books of the Ægyptians on this art, on account of ſome conſpiracies formed againſt the Roman ſtate. Tho' this edict is omitted by moſt of the writers, who have given us the hiſtory of that period, yet it is introduced into a late very celebrated work, principally on the authority of Suidas.[*] It is introduced however with caution and doubt, and with theſe juſt obſervations, that probably theſe ancient books ſo liberally aſcribed to Pythagoras, Solomon, and Hermes, were the pious frauds of more recent Adepts; that there is no mention of the tranſmutation of metals in Pliny's voluminous regiſter of the diſcoveries, the arts, and the errors of mankind; and that if Diocleſian had been convinced of the reality of this valuable art, far from extinguiſhing the memory, he would have converted the operation of it to the benefit of the public revenue.[†] Mr. Gibbon calls this celebrated edict, and the perſecution of Diocleſian, the firſt authentic event in the hiſtory of Alchemy. "The "conqueſt of Ægypt by the Arabs," he adds,

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[*] *Suidas* in Voce χημεια.

[†] *Gibbon's* Hiſtory of the decline and fall of the Roman empire. Vol. I. Ch. 13.

" diffuſed that vain ſcience over the globe. " Congenial to the avarice of the human " heart, it was ſtudied in China, as in Eu- " rope, with equal eagerneſs and with equal " ſucceſs. The darkneſs of the middle ages " enſured a favourable reception to every " tale of wonder, and the revival of learning " gave new vigour to hope, and ſuggeſted " more ſpecious arts of deception." Notwithſtanding an authority ſo reſpectable, I am inclined to doubt, whether the doctrines of Alchemy prevailed, that is, were ſo openly advanced as this paſſage would imply, at that period. I cannot abſolutely prove, that Diocleſian really did not iſſue ſuch an edict, or that the Ægyptians did not boaſt, that they were poſſeſſed of this wonderful degree of chemical knowledge; but it may be juſtly thought extraordinary, that a circumſtance ſo important is not noticed by all the hiſtorians of that and the immediately ſucceeding ages. There are ſome reaſons too, to ſuſpect that this famous paſſage of Suidas has been interpolated by ſome later commentator or editor of that author, or that Suidas himſelf (for he wrote, whatever ſyſtem of chronology we chuſe to follow concerning him, at a time when the alchemical opinions flouriſhed in full vigour) adopted it, without ſufficient proof of its truth, from ſome of the alchemical writers, who had invented it to increaſe the dignity, by eſtabliſhing the antiquity of their art. And we have the more reaſon to believe, that either one or the other of theſe ſuppoſitions is juſt, as Suidas or his interpolator goes much higher in another place, and aſſerts in expreſs terms, "that the golden fleece, which Jaſon and "the Argonauts carried over the Pontic ſea "to Colchis, was only a book written on "ſkins, which taught the manner of making gold by the chemical art." * I only produce this paſſage as a proof of the credulity, or at leaſt facility, with which Suidas introduced any alchemical aſſertion into his collection; for this opinion, whatever may be thought of the former, is ſo abſurd in itſelf, and ſo deſtitute of any ſupport from ancient hiſtory, from the works of the Græcian poets and philoſophers, and ſo totally diſcountenanc'd by every ſyſtem of mythology, that it can require no further comment. It is obvious however to remark, that theſe two paſſages of Suidas ſtand upon the ſame foundation: either they are both interpolations, or they were taken without

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* *Suidas*, in Voce Δερας.

ſufficient examination of true hiſtory from the writings of the alchemiſts.

We are only certain, that in the dark ages, which accompanied and ſucceeded the decline of the Roman empire, the opinion of the poſſibility of a tranſmutation of metals into gold began ſecretly to diſſeminate itſelf. By the conqueſts of the Saracens, amongſt whom or in their ſubjected provinces of Ægypt they ſeem firſt to have ſprung, they were ſtill more generally, tho' ſlowly, propagated throughout Europe: and in a later period, when a more frequent intercourſe between the weſtern and eaſtern nations took place in the Cruſades, the Arabian enthuſiaſm found a ſtage for the moſt ample diſplay of its influence in the minds of thoſe viſionaries, who, from the rude materials formerly imported by the Saracen conqueſts and the eſtabliſhment of their ſchools in Spain, &c. had ſpeculated much on theſe dark ſubjects. It was now the æra of romance and enthuſiaſm. This extravagant principle diffuſed itſelf thro' all orders of men: it appeared with equal prevalence in the courts of princes, in the camps of warriors, in public and domeſtic life, in every occupation and profeſſion, in the loweſt drudgeries of trade, and the ſublimeſt duties of Religion,

gion.* It is not therefore to be thought wonderful, that it incorporated itſelf ſo intimately with the ſpeculations of the alchemiſts, to which it was ſo naturally allied. They immediately conceived themſelves to be philoſophers of a ſuperior order. They arrogated to themſelves a title of diſtinction, and prefixing the arabic particle, expreſſive of preeminence, to the name of their favourite purſuit, they called their art, *Al-Chemia*, themſelves *Al-Chemiſtæ*. They fancied ſtrange analogies between the moſt remote parts of the univerſe, as if all nature was ſubject to alchemical laws. Hence they diſcovered in the properties of metals, a fancied reſemblance to the influence of an equally imaginary emanation from the Sun and the Planets. On this preſumption they aſſumed the ancient aſtronomical characters, as the marks of metallic ſubſtances; and applied to gold the hieroglyphic of the Sun, to ſilver that of the Moon, that of Jupiter to tin, of Mars to iron, of Saturn to lead, of Venus to copper, and of Mercury to quickſilver. * That they might inſinuate, that the knowledge of their myſteries was permitted only to a few, and not attainable by the vulgar, they affected to call thoſe to whom theſe valuable ſecrets were compleatly revealed, *Adepti*. Van Helmont ſays, *Adepti, quorum etiam rector Spiritus Dei eſt*; a ſentence, which may be thought ſufficiently to expreſs a peculiar diſcrimination of this claſs of men from all others, at leaſt in their own vain imaginations, if it be allowed that he there particularly alluded to his own ſect: but it is not eaſy to diſcover his true meaning through the obſcurity of his language. * Indeed the works of all theſe authors are diſtinguiſhed by a peculiar myſterious jargon, which conveys little inſtruction or amuſement. It is ſomewhat remarkable, that their art, their writings, and even their names are veiled with an almoſt impenetrable cloud of darkneſs. As they aſſumed very often, for the ſake of greater myſtery, fictitious appellations, we are but imperfectly acquainted with the true names of moſt of them, the time when they lived, and whether the works generally attributed to them be genuine or ſpurious. Thoſe who are curious to inveſtigate theſe fabulous ages of ſcience will receive much information, if it may be ſo called, from the works of Borrichius, (particularly his tract de Ortu et Progreſſu Chemiæ,) from the entertaining hiſtory of the Hermetic Philoſophy by the Abbé Lenglet du Freſnoy *, and the preface

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* There are many proofs of this poſition in Mr. *Warton's* Hiſt. of Engliſh Poetry, particnlarly in his diſſertations. The following paſſage is much to our purpoſe, and may be applied to philoſophical ſtudies, with no leſs propriety than to poetical compoſition. "It is an eſtabliſh'd "maxim of modern criticiſm, that the fictions of Ara"bian imagination were communicated to the weſtern "world by means of the cruſades. Undoubtedly thoſe "expeditions greatly contributed to propagate this mode "of fabling in Europe. But it is evident, although a "circumſtance which certainly makes no material dif"ference as to the principles here eſtabliſhed, that theſe "fancies were introduced at a much earlier period. The "Saracens or Arabians having been for ſometime ſeated "on the northern coaſts of Africa, enter'd Spain about "the beginning of the eighth century. Of this country "they ſoon effected a complete conqueſt: and impoſing "their religion, language, and cuſtoms upon the inha"bitants, erected a royal ſeat in the capital city of Cor"doua. That by means of this eſtabliſhment they firſt "revived the ſciences of Greece in Europe, will be pro"ved at large in a another place: and it is obvious to "conclude, that at the ſame time they diſſeminated thoſe "extravagant inventions, which were ſo peculiar to their "romantic and creative genius." * * * * * * * * "The ideal tales of theſe eaſtern invaders, recommended "by a brillancy of deſcription, a variety of imagery, and "an exuberance of invention, hitherto unknown and un"familiar to the cold and barren conceptions of a weſtern "climate, were eagerly caught up and univerſally dif"fuſed."

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* As this poſition concerning the uſe of characters in Chemiſtry differs from that which is uſually advanced, I have taken ſome pains in the ſecond Tract to ſhew the principles upon which I have adopted it.

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* *Van Helmont*, de magn. vuln. curatione, §. 129.

* It ſhould be obſerved, that in this work, the learned Abbé ſeems to have confounded together thoſe who cultivated

to Dr Shaw's edition of Boerhaave's Chemiſtry.

After all that has been ſaid on this ſubject, it would be injuſtice not to acknowledge, that it appears conſiſtent with the regular operations of the human mind, that men, converſant in metallurgic proceſſes, and accuſtomed to ſee metallic ſubſtances aſſume a thouſand various forms, ſhould endeavour to extend thoſe converſions, and hope to diſcover a mode of procuring from the moſt unpromiſing the moſt beautiful and the moſt precious of all theſe metals. The wonders, which they every day ſaw ariſe from their art, made them conceive hopes of adding this new prodigy to thoſe, which they had already ſeen effected. They were not enabled by former experiments to judge concerning the poſſibility of their undertaking; and even now the queſtion is in the minds of ſome Chemiſts not abſolutely decided *. To condemn the firſt trials would be therefore unjuſt, and as we are happily relieved by a more enlightened philoſophy from the abſurd fictions, which obſcured and diſgraced their experiments, it would be ungenerous not to

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tivated genuine Chemiſtry, and many who were only inquirers into the hiſtory of nature, with thoſe who advanced pretenſions to the knowledge of the grand Arcanum.

* Preface to the Chemical Dictionary. 4to Edit. p. v.

confeſs the obligations, which this ſcience owes to their unremitting perſeverance. Their example led men by degrees to that important change in the hiſtory of Natural Philoſophy, when hypotheſis and fiction gave way to experiment and obſervation. The extraordinary diſcoveries which they made, and the innumerable proceſſes, which they themſelves inſtituted or ſuggeſted to future operators in a more enlightened period, have contributed by various accidents to the perfect diſcloſure of many admirable ſecrets. In confirmation of this I need only mention their proficiency in Pyrotechny, or the invention of exploſive and inflammable compoſitions, the preludes to the diſcovery and application of gunpowder. Of theſe we have a celebrated inſtance in the Feu Gregois or Grecian Fire, ſo much ſpoken of by the Poets and Hiſtorians of the immediately ſucceeding ages, and particularly mentioned in the hiſtory of the Princeſs Anna Comnena, who lived in the beginning of the 11th Century *. It is deſcribed as a ſort of

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* Alexiad. Lib. 11. p. 336. and Lib. 13. p. 383. Edit. Hoeſchel. fol. Paris 1651. This work is the hiſtory of the Emperor Alexius, the father of the fair hiſtorian, and has been deſervedly celebrated, as well for its own internal merits and graces of compoſition, as for the piety and filial affection with which it is dictated. A work, which has been

wild-fire, not eaſily extinguiſhable by water, and therefore much uſed in naval engagements, being thrown by the hand or by in-

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been ſo highly complimented by the pen of Mr *Hayley*, requires no additional commendations from me: but I hope I ſhall be pardon'd, even by thoſe who are moſt prejudiced againſt the impertinence of digreſſion, and the parade of quotation in writings of this kind, for tranſcribing the following paſſage.

But while monaſtic night with gathering ſhades
The ruin'd realm of hiſtory invades;
While pent in Conſtantine's ill fated walls,
The mangled form of Roman grandeur falls;
And, like a gladiator on the ſand,
Props his faint body with a dying hand;
While ſavage Turks or the fierce ſons of Thor,
Wage on the arts a wild Titanian war;
While manly knowledge hides his radiant head,
As Jove in terror from the Titans fled;
See! in the lovely charms of female youth,
A ſecond Pallas guards the throne of Truth!
And with COMNENA's royal name impreſt,
The zone of Beauty binds her attic veſt!
Fair ſtar of Wiſdom! whoſe unrival'd light
Breaks through the ſtormy cloud of thickeſt night;
Tho' in the purple of proud miſery nurſt,
From thoſe oppreſſive bands thy ſpirit burſt;
Pleas'd, in thy public labours, to forget
The keen domeſtic pangs of fond regret!
Pleaſed to preſerve, from time's deſtructive rage,
A father's virtues in thy faithful page!
Too pure of ſoul to violate, or hide
The Hiſtorian's duty in the Daughter's pride!
Tho baſe oblivion long with envious hand
Hid the fair volume which thy virtue plan'd,
It ſhines, redeemed from ruin's darkeſt hour,
A wondrous monument of female power;
While conſcious Hiſt'ry careful of thy fame,
Ranks in her Attic band thy filial name,

ſtruments from one ſhip to another in veſſels, which broke by the colliſion, and dicharged

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And ſees, on glory's ſtage, thy graceful mien
Cloſe the long triumph of her ancient ſcene.
Hayley's Eſſay on Hiſt. Epiſt. 1. ad fin.

Mr *Hayley* has ſubjoined in his notes a more particular account of this extraordinary Princeſs, and a tranſlation of the preface to her Alexiad. This Hiſtory is printed in the voluminous collection of the Byzantine hiſtorians; but as few perſons, who may condeſcend to peruſe theſe tracts, may have opportunity, and fewer ſtill inclination, to ranſack thoſe immenſe volumes for information concerning the Græcian Fire, it may not be uſeleſs to extend this note by adding a paſſage from Mr *Warton's* Hiſtory of Engliſh Poetry, introduced by ſome lines of the old Poem of *Richard Cueur de Lyon*, wherein mention is made of the *Fyre Grekys*. "This Fire Grekys or Græcian fire" ſays the very ingenious Hiſtorian "ſeems to be a compoſition "belonging to the Arabian Chemiſtry. It is frequently "mentioned by the Byzantine Hiſtorians, and was very "much uſed in the wars of the middle ages both by ſea "and land. It was a ſort of wild-fire, ſaid to be inextin"guiſhable by water, and chiefly uſed in burning ſhips, "againſt which it was thrown in pots or phials by the "hand. In land engagements it ſeems to have been diſ"charged by machines conſtructed on purpoſe. The ori"ental Greeks pretended, that this artificial fire was "invented by Callinicus, an architect of Heliopolis, under "Conſtantine; and that Conſtantine prohibited them from "communicating the manner of making it to any foreign "people. It was however in common uſe among the na"tions confederated with the Byzantines: and Anna "Comnena has given an account of its Ingredients (ſee "du Cange not. ad Joinvil. p. 71. and Gl. Lat. V. Ignis "Græcus) which were Bitumen, Sulphur and Naphtha. "It is called *Feu Gregois* in the French chronicles and "romances. Our minſtrel, I believe, is ſingular in ſaying, "that Richard ſcatter'd this fire on Saladin's ſhips: many "monkiſh hiſtorians of the Holy War, in deſcribing the "ſiege of Acon, relate, that it was employed on that occaſion

and

their inflammable matter. Comnena informs us, that it was compoſed of Sulphur, and Bitu-

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“ and many others, by the Saracens againſt the Chriſtians. “ (ſee more particularly Chron. Rob. Brun. p. 170 and “ Benedict. Abb. p. 652. and Joinvill. Hiſt. L. p. 39. “ 46. 52. 53. 62. 70.) Procopius in his hiſtory of the “ Goths, calls it *Medea's Oil*, as if it had been a prepara- “ tion uſed in the ſorceries of that enchantreſs (Proc. “ iv. 11.” *Warton's* Hiſt. of Eng. Poetry Vol. I. p. 157.

The numerous references of Mr Warton concerning the Grecian fire would prevent any addition of mine, did I not think it neceſſary to correct his citation from Procopius, and to ſubjoin one or two obſervations from other Authors. According to his repreſentation, it may be thought, that Procopius calls the Græcian fire *Medea's Oil*, but he only ſays, that the Greeks gave that name to the Median Naptha. The paſſage is as follows,

Αγγεια δε θειου τε και Ασφαλτου εμπλησαμενοι και φαρμακου, ὁπερ Μηδοι μεν Ναφθαν καλουσιν, Ἑλληνες δε Μηδειας ελαιον, πυρι τε ταυτα ὑφαψαντες, επι τας Μηχανας των κριων εβαλλον· ἁπερ ολιγῳ εμπιμπρηναι πασας εδεησεν.

Procop. de Bell. Goth. L. IV p. 594. Ed. Hoeſchel. Paris fol. 1651.

In the Tranſlation of the paſſage from Procopius in this edition, the word φαρμακον is render'd by *venenum*, which is evidently improper, becauſe Naphtha is deſcribed by many of the moſt reſpectable Græcian authors as poſſeſſing highly medicinal qualities, (ſee particularly *Dioſcoridis* Ch .86), *Venenum* is ſometimes uſed in ſpeaking of the ſubſtances employed in the embalming of bodies, but otherwiſe always in the bad ſenſe, as a poiſon. φαρμακον is at leaſt as often, if not more frequently, uſed in the good ſenſe, than in the bad. Of this innummerable inſtances might be given (ſee the word in *Conſtantinus'* or *Scapula's* Lexicon: the latter expreſsly ſays of it, Pro medicamento ſalutari Græci dictum volunt, qu. φερων ακος, ferens medelam, pro exitiali qu. φερων αχος, ferens triſtitiam). *Suidas* likewiſe remarked, that the Greeks called Naptha *The Oil of Medea*; but his annotator *Kuſterus* ſuppoſes his obſerſvation

to

men, to which Procopius adds Naptha, but probably this part of the account is not exact.

To return to the more ancient Alchemiſts. Even in this crowd of writers there are ſome, who have expreſſed themſelves with leſs obſcurity than others, and in this number the Univerſity of Oxford has the honour of ranking one of her ſons, one of the firſt Fellows of Merton College, *Roger Bacon* *,

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to have been derived ſolely from the above cited paſſage of Procopius, (ſee Kuſteri Suidas Vol. II. 602.) It is poſſible after all, that this bitumen obtained this title by a very eaſy miſtake. As the name of the country from which it was imported, *Media*, bears a great reſemblance to that of the celebrated Enchantreſs, *Medea*; it is very reaſonable to imagine, that the vulgar, entertaining a high opinion of its virtues, might conceive, that it was derived from ſome præternatural ſource; and might regard it, not as a natural and common exſudation from the ſoil in the province *Media*, but as a compoſition invented by the extraordinary ſkill of the ſorcereſs, *Medea*. See the article *Huile de Medie* in the *Encyclopedie*..

* The building, in which this celebrated Philoſopher (according to tradition) reſided, on the ſouthern bridge over the Iſis, having been lately taken down to enlarge and open that avenue to the city of Oxford, it may not be unentertaining to thoſe, who think that ſuch valuable monuments of Antiquity ſhould not be ſo eaſily given up to the prevailing rage for novelty, under the ſpecious name of improvement, to peruſe the following paſſages concering that edifice.

The Abbé *Lenglet du Freſnoy*, ſpeaking of the perſecutions, which Bacon underwent, adds "Enfin ſoit ignorance, ſoit jalouſie, comme il n'arrive que trop ſouvent "dans les communautés, ils le perſécuterent en 1278, "et l'annèe ſuivante ils eurent le credit de le faire em-

"priſonwho appears to have had a thorough acquaintance with many important operations in Chemiſtry, which we deem modern. Amongſt

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" priſonner, et cet habile philoſophe eſt obligé d'avouer, " qu'il eut plus d'une fois lieu de ſe repentir d'avoir pris " tant de peine a ſe perfectionner dans les arts et dans les " ſciences. Il fut meme contraint d'abandoner la maiſon " de ſon ordre, et de ſe former une retraite, ou il travailloit " plus tranquillement, et l'on aſſure, *que l'on montre toujours* " *aupres d'Oxfort une maiſon qui porte encore le nom de* " *Frere Bacon*, qu'il avoit choiſie pour ſes etudes, et ſes " experiences." L'Hiſt. de la Phil. Herm. Vol. I. p. 115. To this obſervation he ſubjoins the following paſſage from Borrichius. " Extat hodieque Oxonii *Domus Rogeri* " *Baconis*, incolis The *Howſe of Fraer Bacon* appellata, " quam, cum ab altera Tameſis urbem lambentis ripa, mihi " oſtenderet Edmundus Dickinſonus, Medicus inſignis, " adjecit, Rogerium Monachorum quorundam obtrectati" onibus quotidie proſciſſum in ulteriori ripa fixiſſe ſibi " ædes." Borrich. de Ort. et Prog. Chemiæ P. 118 in 4to Haffniæ, 1668.

This celebrated manſion ſtood for many years uninjured by the aſſaults of time, or the ſtill more violent efforts of zeal for innovation and improvements. So lately as the year 1773, an ingenious Bard attempted to conſole the admirers of antiquity with a vain promiſe of its eternal duration, which he could not conclude, but with a melancholy preſage of the cauſe from whence its downfal would originate.

" Dic age, num veteris reſtant veſtigia portæ
Nulla tibi? quid ſacra ergo penetralia cenſes
Quo ſpectanda modo, quâ nunc ſublimis ad auſtrum
Stat ſummo de ponte *Domus veneranda* BACONI,
Relligione loci ſeros intacta per annos?
Hoc tibi Palladium, nunquam de ſede movendum
Sacratâ, niſi quod via ſat vicina moleſta eſt,
Heu Genti nimiúm, velut Appia, dura Togatæ."

From an elegant and ſpirited Dialogue concerning the alterations in Oxford, ſpoken before Lord North and the Univerſity at the Encœnia 1773 by Richard Hely Hutchinſon and David Henry Urquhart, Gentlemen Commoners of Magdalen College.

others, he his thought to have had a perfect knowlege of the nature and compoſition of Gunpowder: yet the honour of this diſcovery, which has been the ſource of ſuch ſurprizing revolutions in the hiſtory of the world, has been aſcribed almoſt by univerſal conſent to a monk, often erroneouſly called a Jeſuit, of Goſlar in Germany, *Berthold Schwartz*, who lived many years after. It is moſt probable however, that neither Bacon nor Schwartz were the original inventors of this compoſition. It is not impoſſible, that Bacon derived his acquaintance with it from his indefatigable examination of the Arabian writers, to the ſtudy of which he devoted no ſmall part of his time and attention. This opinion ſeems to be confirmed by this circumſtance, that the Moors in Spain were amongſt the firſt perſons, who employed gunpowder in war; that they uſed it at the ſiege of Algeſiras * eleven years before the date of Schwartz's diſcovery §; and ſtill farther, if we may credit the accounts of ſome hiſtorians of no mean character, that its uſe was known in Aſia, and particularly in China, many years before the date of its employment in Europe †.

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* 1343. § 1354.

† The Teſtimonies, by which this point muſt be determined, are all adduced by Dr *Watſon* in his 10th Eſſay,

Independent of this point, it muſt be admitted, that Bacon was indiſputably a man of no common talents; and that it is wonderful, conſidering the ignorance of the age in which he lived, from what ſources he obtained ſuch extenſive knowledge on all ſubjects. His writings, tho' frequently darkened with the jargon of alchemy, are compoſed in general with a conſiderable degree of elegance and ſtrength, and abound with many excellent obſervations, perfectly conſonant to the diſcoveries of later times in Chemiſtry and Natural Hiſtory. *

To the name of Bacon very few others of that age can be added. With great ſtudy, and by the help of ſubſequent experiments, we have been able to diſcover, that they probably knew more than they wiſhed to reveal; but from their own writings we learn very little. Their knowledge is invellopped in myſterious language, and uncouth expreſſions, which are very frequent even in the writings of Bacon himſelf.

Eſſay, which expreſsly treats of the time when gunpowder was diſcovered. It is therefore needleſs to tranſcribe them, as that work ſhould be in the poſſeſſion of every one who is ſtudious of Chemiſtry.

* See Dr *Freind*'s account of the life and writings of this extraordinary man in his hiſtory of Phyſic.
Freind. Op. Omn. folio. p. 537, et ſeq.

A more particular account of theſe writers, and a liſt of all the alchemical authors, ſuppoſititious or real, is given in the preface to Dr Boerhaave's Chemiſtry, and the notes of Shaw. *

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* The ſentiments advanced above concerning Alchemy in general, the character of the Alchemical authors, and particularly the doctrine of the tranſmutation of metals, are the reſult of an attentive examination of almoſt every work, that has been written intelligibly on this ſubject, in none of which has any thing appeared tolerably plauſible in ſupport of theſe pretenſions. Vague empirical aſſertions or hypotheſes, unſupported by argument or experiment, diſguiſed under an impenetrable maſk of uncouth language, have been adduced as evidence and demonſtration.—Dr *Price*'s celebrated experiments may, by ſome, be ſuppoſed to deſerve ſome attention; but, if it were neceſſary, it would be eaſy to ſhew, that theſe experiments are not adequate to the proof of the concluſion, which they may be thought to eſtabliſh: it is ſaid, if it were neceſſary, becauſe the author himſelf, in his ſecond edition, has clearly renounced all pretenſions to the diſcovery of a mode of tranſmuting metals, expreſſing himſelf ſorry, that "his "account, to which he gave only the unaſſuming title of "*Experiments on Mercury*, &c. ſhould have been held out "to the world, as announcing the *Diſcovery of the Philo*-"*ſopher's ſtone:* this, in the *uſual* ſenſe of the word, he, "as well as others, thinks merely chimerical." In this edition he has ſtudiouſly omitted or altered every expreſſion or ſentence, which might be thought to betray an attachment to, or a belief in, the common opinions of Alchemy. In a future more extenſive appendix, the author has promiſed to explain his ſentiments more fully on theſe ſubjects: 'till then the candid and liberal ſhould perhaps ſuſpend their judgment of his late publications, eſpecially as he intimates an intention to illuſtrate "the principles "of ſome of his proceſſes, and to ſhew their analogy to "experiments related by Chemiſts of reputation." If in this line Dr *Price* ſpeaks explicitly and ingenuouſly, much inſtruction

Not contented with the little ſucceſs they had hitherto had in their favourite ſearch

inſtruction may be expected from his chemical erudition and practical experience. In this work we may hope to ſee the doctrine of the original and progreſſive ſtate of the baſes or earths of metals clearly inveſtigated; and the balance held with an impartial hand between the two opinions, which have been maintained on the point.

With regard to the origin and generation of metals, and the real nature of the earths that conſtitute their baſes, naturaliſts have held very different opinions. It is not within the compaſs of my ability to diſcuſs the queſtion fully, and in this place it would be improper. I ſhall only therefore venture to introduce a few remarks in ſome degree connected with that diviſion of the ſubject, which is more immediately before us. It has been often alledged, or implied by chemical writers [a], that there is really but one and the ſame baſis or earth of all metals, which combined in different modes or various proportions with ſome other principles, particularly the Phlogiſton (and ſometimes the Mercurial principle is adduced) gives all the forms of metallic ſubſtances. If this theory could be confirmed, it would be very favourable to the doctrine of the tranſmutation, as it gives a foundation to infer, that if certain principles could be in ſome caſes taken away, or in others ſuperadded, the qualities, that is the nature and eſſence of a metal, might be changed, or in other words, it might be tranſmuted into another metal. That the Alchemiſts maintained this hypotheſis is obvious from thoſe parts of their writings which are tolerably perſpicuous. That many Chemiſts of much later date have entertained the ſame ſentiments is plain from the paſſages of *Becher* and *Stahl*, to which I formerly referred (ſee page 25), and particularly the ſecond ſupplement to the *Phyſica Subterranea*, Theſ. I, "De tranſmutationis metallicæ neceſſitate et "connexione cum univerſo naturæ curſu." But there is a fallacy in the defence of this Theſis, which will perhaps be found in all the writings on the ſame ſide of the queſafter gold, the Alchemiſts in the twelfth and thirteenth centuries advanced pretenſions,

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[a] See *Bergman*'s Opuſcula, Vol. I. De Arſenico; and Dr *Price*'s Introduction to the 1ſt Edit of his Experiments.

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tion, which proceed upon the ſame mode of argument. The changes, which are there inſtanced in the courſe of nature, or the operations of art, are by no means applicable to the point in diſpute: they only ſhew that the world and all its conſtituent parts are ſubject to alterations and revolutions; and that the animal, vegetable, and even mineral kingdom is influenced by ſimilar laws: but they by no means prove, that in any one inſtance any genus or ſpecies of the natural productions, in the animal, vegetable, or mineral kingdom, has been changed into any other in that mode and degree, which the idea of tranſmutation implies. It holds perhaps throughout nature, that the genera and ſpecies, which compoſe the animate and inanimate world, are immutable and invariable; that they cannot by any natural or artificial proceſs be ſo far deprived of their own eſſential qualities, as to aſſume abſolutely thoſe of another ſpecies or genus. Therefore it may be conceived, that the different metals are ſubſtances, as the naturaliſts ſay, *ſui generis*, of a ſpecific unalterable nature; and though by various artificial or even natural means, by combination, ſolution, precipitation, their forms may be concealed and apparently altered, yet they continue perfectly diſtinct however diſguiſed. And poſſibly, it may be with truth alledged, that no mode of treatment, no addition, no proceſs of reduction can really give to a metal or metallic earth any other ſimple homogeneous metallic form, than that which is peculiarly appropriated to it.

If this doctrine be admiſſible, and perhaps there are many good arguments to urge in its confirmation, the opinion of a tranſmutation of metals, either by art or nature, can have no foundation.

In *Shaw*'s Principles of Philoſophical Chemiſtry (Supplem. Sect. 2.) is a treatiſe on the Philoſopher's Stone, in which he enumerates the ſeveral modes adopted by different Alchemiſts in this vain and fruitleſs ſearch, with many curious and inſtructive obſervations, verging indeed a little ſometimes to credulity.

infinitely more abſurd, to the diſcovery of an *univerſal medicine*. "The metaphorical and "hieroglyphic manner of writing, which "obtained amongſt them, ſeems to have "given riſe to a practice of calling the "means made uſe of for bringing metals to "perfection by the name of medicines, the "imperfect metals by the appellation of ſick "men, and gold by that of a healthy man "enjoying all his faculties. Hence the uni-"nitiated fell into the error of ſuppoſing "that theſe expreſſions were to be under-"ſtood in the literal ſenſe, eſpecially as the "adepts called the impurities of the baſer "metals by the title of leproſy, which was "then deemed the moſt incurable of all "diſeaſes." *

Theſe circumſtances, in a ſuperſtitious and credulous age, gave riſe to an opinion, which ſoon ſpread far and wide, that the perſons thus endued with knowledge of the intimate operations of nature and art, were poſſeſſed of two important ſecrets: and it was conceived that a proceſs, nearly allied to that which converted the baſer metals into gold, gave alſo a preparation, an *elixir vitæ*, capable of reſtoring the moſt active health to the moſt infirm body, and of perpetuating human life to an unlimited duration. The Alchemiſts applied this favourable opinion concerning them to their advantage, and very readily claimed a power, which the vulgar were already diſpoſed to believe they poſſeſſed. The doctrine of the univerſal medicine was, I believe, firſt openly advanced by *Raymond Lully* about the beginning of the fourteenth century, in a tract entitled, *De Secretis Naturæ ſive de Quinta Eſſentia.*

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* Boerhaave's Hiſt. of Chemiſtry, Shaw's Edit. Vol. I. p. 26.

This prejudice in favour of the pretenſions of the Alchemiſts naturally led them, that they might be able to vindicate their claim, to a minute examination of animal, vegetable, and mineral ſubſtances. Thus they obtained many important preparations, and by the ſucceſsful application of them in a great variety of diſeaſes, which baffled all the ſkill of the regular practitioners, (the implicit followers of Galen and his Arabian commentators) they ſtill farther enforced and eſtabliſhed the belief of their poſſeſſion of a Panacea.

Not long after * Lully, *Baſil Valentine* carried theſe pretenſions to a much higher pitch in a work, which in its title, *Currus Triumphalis Antimonii*, ſhews the inſolence, with which he and his followers trampled upon the ruins of the ſyſtem of Galen.

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* Though the preciſe date of the birth of *Lully* is not agreed on by authors, the year 1315 is generally allowed to have been the æra of his death. The birth of *B. Valentine*

But the compleat ſuperiority of the chemical ſect was reſerved for the age, the abilities, and the arrogance of *Paracelſus*.

This extraordinary perſon was born at *Einſedlin*, an obſcure town in *Switzerland*, in the year 1493, nearly at the very period when the venereal diſeaſe made its firſt appearance in Europe. * Its ravages ſpread thro' every

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lentine is ſtill more uncertain: it has been aſſerted that he was born towards the latter end of the 14th century, and this opinion I am inclined to adopt: but that I may not be thought to ſpeak too confidently on this point, I will qualify the aſſertion by referring to Dr *Alſton*'s *Materia Medica*, Vol. I. p. 294. where the curious reader will find much information concerning the hiſtory of Baſil Valentine, (if after all it be allowed that this is actually the name of a real perſon) and likewiſe concerning the uſe of Antimony in medicine.

* According to the moſt accurate hiſtorians [a], this Malady was imported from America in the very year of the birth of this extraordinary perſon; a remarkable concurrence of events! which can hardly paſs unnoticed by any one, who is curious in inveſtigating the connexion of cauſes and their effects in the moral or natural hiſtory of the world: for at the very ſame period, when this new plague was introduced into Europe, a man was alſo born, whoſe daring empiriciſm firſt evinced ſatisfactorily the powers of that ſpecific medicine, by which alone it can be with ſecurity and certainty combated and counteracted.

[a] *Robertſon*'s Hiſt. of America, Vol. II. Note 22. p. 482.
Aſtruc de Morb. Ven. L. I. c. 10.

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kingdom with ſuch uncontrouled violence, as almoſt to juſtify the expreſſions of a contemporary poet, who painted from the life, and gives this dreadful ſcourge, which he denominates *Peſtis*, a very diſtinguiſhed pre-

It cannot indeed be aſſerted, that Paracelſus was the firſt perſon, who employed Mercury in the treatment of this diſorder:[a] yet the conſequence and influence, which the chemical ſect and their doctrines acquired from his patronage and ſupport, brought the chemical remedies more into repute; their virtues were more extenſively tried, and more generally acknowledged; and Mercurial medicines in particular, which from the injudicious, ill-directed, or timid practice of their firſt employers,[b] were reprobated as ineffectual or dangerous, were found to be perfectly ſecure, and of the moſt indiſputable efficacy. Therefore, though Paracelſus did not firſt ſuggeſt the application of Mercury in this diſorder, yet perhaps we are indebted to him and his diſciples for the convincing proofs of its ſafety and ſucceſs, of which we are now poſſeſſed; for they held up the light to ſucceeding inquirers, and pointed out the path, which with ſo much advantage to mankind, they have purſued.

That the effects, here aſcribed to the proſecution of the ſtudy of Chemiſtry, the introduction of chemical remedies, and the conſequent advantages reſulting to the ſcience and practice of medicine, are not unjuſtly referred to the influence of Paracelſus, and the zeal for chemical improvement, which he diſſeminated, is obvious from hence; that thoſe authors, who profeſſedly write the hiſtory of medicine, in dividing it for greater perſpicuity into diſtinct periods, date the ſeventh (that wherein the chemical doctrines prevailed in the ſchools) from the birth of Paracelſus, thereby acknowledging, that this revolution in medicine was principally, if not ſolely, to be imputed to him.[c]

[a] *Aſtruc*'s Catalogue of Authors. Lib. V. of his work.

[b] *Aſtruc* de Morb. Ven. L. II. C. 7. p. 321.

[c] *Lettſom*'s Introduction to the Hiſtory of Medicine, p. v.

eminence in his enumeration of the calamities, under which his oppreſſed and afflicted country groaned :

" Quippe Lue hac naſcente, (ſays *Fracaſtorius*) putem ſimul omnia diras
" Eumenidas ceciniſſe fera et crudelia nobis :
" Tartareos etiam barathro (dira omina!) ab imo
" Exciviſſe lacus ; Stygiâque a ſede Laborem,
" *Peſtemque*, horribilemque Famem, Bellumque, Necemque.
" Dii Patrii! quorum Auſonia eſt ſub numine! Tuque,
" Tu Latii Saturne Pater, quid gens tua tantum
" Eſt merita! an quicquam ſupereſt dirique graviſque,
" Quod ſit inexhauſtum nobis? ecquod genus uſquam
" Averſum uſque adeo cœlum tulit? * * *

He concludes this pathetic deſcription with an affectionate addreſs to his native province, the territory of Verona,

" O Patria, ô longum felix, longumque quieta
" Ante alias Patria, ô Divûm ſanctiſſima Tellus,
" Dives opum, fæcunda viris, lætiſſima campis
" Uberibus, rapidoque Atheſi, et Benacide lympha,
" Ærumnas memorare tuas, ſummamque malorum
" Quis queat? et dictis noſtros æquare labores,
" Et turpes ignominias, et barbara juſſa?

“ Abde caput, Benace ; tuo et te conde ſub amne;
“ Victrices nec jam Deus interlabere lauros.” *

Phyſicians in vain ranſacked the works of Galen and his Arabian commentators. They found no certain or ſatisfactory traces of any ſimilar diſeaſe, and their experience furniſhed them with no remedy that could counteract its malignity : but that divine gift, which they ſo fruitleſsly ſought in the learned volumes of antiquity, the Chemiſts diſcovered in Mercury, the favourite ſubject of ſo many of their operations. Armed with theſe uncommon powers, with Paracelſus at their head, they triumphed univerſally in the fallen fame of their opponents. And

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* *Fracaſtorii* Siphylis, Lib. I.

The following paſſage of another contemporary author, who wrote a tract expreſsly de Morbo Gallico, confirms in very ſtrong terms the deſcription of Fracaſtorius. “ Videmus Summum Creatorem hoc tempore, nobis iratum ob nefanda ſcelera noſtra, nos vexare cum Morbo hoc *truculentiſſimo*, qui jam non per Italiam, ſed etiam per omnem pene Chriſtianam Religionem, viget. Ubique tubarum clangor ſonat, armorum ubique ſtrepitus auditur, ubique Bombardæ inſtrumenta bellorum conficiuntur, et loco ſaxorum ſphæricorum ferrea remanent, et hoc tempore inaudita fabricant ; Turcæ in Italiam vocantur. Quot jam incendia, quot deprædationes, quot miſerorum mortalium ſtrages jam vidimus, quot et quantas viſuri ſumus ? Utinam mentiar !

Coradini Gilini Opuſc. de Morb. Gall. citat. in *Aſtruc* de Morb. Ven. L. V. p. 428.

if this diſcovery alone had diſtinguiſhed the labours of this ſect, it muſt be acknowledged, that theſe labours would be moſt juſtly entitled to the applauſe and gratitude of ſucceeding ages.

The character of Paracelſus is perhaps the moſt ſingular recorded in philoſophic hiſtory. He was a compound of great abilities and induſtry, combined with a heated imagination, unlimited credulity, the moſt conſummate arrogance, and the moſt ſhameleſs profligacy of manners. He travelled thro' moſt parts of Europe, (but not in Aſia, as he himſelf inſinuates, and ſome of his biographers aſſert) collecting from every ſource, from phyſicians, barbers, old-women, conjurors, and alchemiſts, whatever information they could give. He deſpiſed, as empirics and adventurers in the region of literature generally do, the regular path of education. He expreſſed publickly his contempt of the knowledge and learning of the ſchools, and particularly of the Arabians: and being invited by the magiſtrates of Baſil to deliver lectures in phyſic and ſurgery, he ſeated himſelf in his profeſſorial chair, and ordered the works of Galen and Avicenna to be burnt with great ſolemnity before him. Tho' thus raiſed to the higheſt eminence in his profeſſion, he debaſed his character by the moſt ſcandalous exceſſes, and brought his life to a very early period, in his 47th year; though he had inculcated the opinion, that he poſſeſſed the univerſal medicine, with ſuch confidence, that he ſeems at laſt to have believed it himſelf: for he aſſured his diſciples, that by his *elixir proprietatis* he could extend his own life, or that of any other perſon, to any deſired degree of duration; and even ſecure to them, or himſelf, immortality upon earth.* Paracelſus added to the

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* That this account of this ſingular character may not be thought exaggerated, let it be compared with the following paſſage. In the original, references are made to thoſe parts of the writings of Paracelſus, or other authors, from which the ſeveral particulars relative to his life are deduced. (See *Aſtruc.* p. 458.)

“ Paracelſus ab ætate primâ ſtudio Chemiæ, quæ tunc
“ in obſcuro latebat, ſedulò incubuit; primùm apud Joan-
“ nem Trithemium Abbatem Spanheimenſem, virum doc-
“ tum; inde apud Sigiſmundum Fuggerum, virum nobi-
“ lem, alioſque non paucos, quos ipſe recenſet non ſine
“ oſtentatione: et arcana, quotquot reperire potuit, corra-
“ ſit undique delectu multo a *Medicis*, *Chirurgis*, *Tonſoribus*,
“ *Aniculis*, *Magis*, *Chimiſtis*, *Nobilibus* et *Ignobilibus*; imo
“ etiam a *Zigeunis* (les Bohémiens, Gypſies) *Nigromanticis*,
“ *Agyrtis*, et *ſenioribus Ruſticis*.

“ Vitam duxit inopem, vagam, errabundam, multùm
“ peregrinatus per Helvetiam, Alſatiam, Carinthiam, Au-
“ ſtriam, Moraviam, Sueviam, cæteraſque Germaniæ pro-
“ vincias pleraſque, ſed tamen *non per Galliam*, *Italiam*.
“ *Hiſpaniam*, *Portugalliam*, *Angliam*, *Boruſſiam*, *Lithua-*
“ *niam*, *Poloniam*, *Pannoniam*, *Valachiam*, *Tranſylvaniam*,
“ *Croatiam*, *Illyricum*, &c. ut ipſe gloriatur in *Præfatione*
“ *Chirurgiæ magnæ*; ac multò minùs per Arabiam integro
Decennis,

abſurd pretenſions of his predeceſſors one infinitely exceeding them all. In his treatiſe entitled *de archidoxis*, we have the firſt traces of the doctrine of an *Alkaheſt* or *univerſal ſolvent*. This opinion has been ſtill farther advanced and inculcated by *Van Helmont*, who revived, or rather extended it to the utmoſt degree, ſo that no addition could be afterwards made to his doctrines, * in that

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" decennio, ut fingit Bickerus de *Hermete redivivo* : quâ
" de re conſule Sennertum, De *Conſenſu Galenicorum et*
" *Peripateticorum cum Chimicis*, Cap. 4. &c. * * *

" Certe Prodigium hominis fuit, qui ebrietati et cra-
" pulæ deditus, aurigæ ſimilis et aurigarum ſodalitio
" mirificè delectatus, literarum ignarus, latinè vix ſciens,
" Magiæ credens, volens ipſe Magus credi, nomen Pro-
" feſſoris S. S. Theologiæ ſibi falſò aſſumens, circa Reli-
" gionem delirans, mente parùm conſiſtens, nugivendu-
" lus, fabularum artifex egregius, opinionum portenta
" vocibus novis, inauditis, barbaris, monſtroſiſſimis oc-
" cultabat.

" Omnia enim ſtolidi magis admirantur amantque,
" Inverſis quæ ſub verbis latitantia cernunt."

Lucret. L. 4.

It is needleſs to add more. If further information is required on this head, the reader may be perfectly ſatisfied by conſulting *Boerhaave* and his commentator, and the extracts which they have made from *Le Clerc*, *Bacon*, &c. I ſhall only ſubjoin one obſervation from Dr *Shaw*, as it will add force to what I have aſſerted above concerning the effect of the doctrines of Paracelſus. " What contri-
" buted ſtill more to his reputation was, his becoming
" acquainted with the excellency of Mercury in the Ve-
" nereal Diſeaſe, which had then newly broken out, and
" ſpread itſelf over Europe."

Shaw's Boerhaave, Vol. I. p. 40.

* *Boerhaave* informs us, that though he had examined the works of *Paracelſus* with minute accuracy and labour,

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medley of truth and nonſenſe, which he gave to the world as the reſult of 30 years expe-

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he was not able to find more than one paſſage, in which the doctrine of an *Univerſal Solvent* or *Alkaheſt* was alluded to. From ſo ſlight a ſource *Van Helmont* derived his original idea; and his enthuſiaſtic imagination readily aſcribed to this wonderful menſtruum an extent of operation and influence, which only ſuch a mind could conceive; an influence, ſo important and univerſal, that *Boerhaave* and *Boyle* both acknowledged, if *it was ever* revealed to mortals, it was the moſt precious of all the gifts which divine goodneſs had beſtowed, infinitely more valuable and more to be deſired, than the Philoſopher's Stone. Dr *Shaw* in one of his notes ſeems to allude to a diſtinct tract of Van Helmont on this ſubject, but I believe none ſuch was ever publiſhed. Boerhaave in his account of the Alkaheſt conſtantly refers to Helmont's general works, where the traces of this doctrine are ſcattered every where without any order or method.

The learned reader will find many references to theſe paſſages in moſt of the ſyſtematical writers who ſucceeded Helmont, particularly in the Phyſica Subterran. of *Becher*, in the ſupplement to that work by *Stahl*, and in the numerous treatiſes of *Boyle*; but it is needleſs to ſearch after detached paragraphs in theſe voluminous writings, when the whole doctrine is ſo fully diſplayed and illuſtrated by *Boerhaave*.[a] It may not be uſeleſs to obſerve, that the references, both in the original and in the tranſlation, have relation to the Amſterdam Elzevir edition publiſhed in 1652, which, Dr Shaw expreſsly ſays, is the moſt accurate, and the moſt complete, collection of Helmont's works. The concluding ſentence of Boerhaave's account of the Alkaheſt may perhaps be thought to ſhew, that even his great mind (and the ſame may in ſome degree be alledged of Boyle,[b] but more certainly of Becher[c]) received ſo ſtrong an impreſſion from the poſitive aſſertions of V. Helmont; that, like another

[a] *Boerhaavii* Chemia Edit. Lugd. Batav. Vol. I. p. 848. *Shaw*'s tranſlation, Vol. I. p. 569.

[b] *Boyle*'s work's, 4to. Vol. I. p. 435, 560, 636, 653, 654. Vol. IV. p. 298.

[c] *Becheri* Phyſ. Subterran. L. I. Sect. iii. C. iv. N. 9, et ſeqq.

diſtin-

rience in a profeſſion; to which, he informs us, he was expreſſly commanded to dedicate his life by the Divine authority, delivered to him by the angel Raphael in a dream. But tho' his vanity perſuaded him to commit his crude conceptions to writing, he appears, at the concluſion of the account of his ſtudies, to have been ſenſible, that he had been deluded by a phantom: "Tandem cum Salo-
"mone cognovi, me fruſtra adhuc ſpiritum
"meum torſiſſe, vanamque eſſe ſcientiam
"omnium, quæ ſub ſole ſunt, vanas curio-
"ſitatum indagationes. Et quem Dominus
"Jeſus vocaverit ad ſapientiam, ille et non
"alius venturus eſt: imo qui ad faſtigium

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diſtinguiſhed writer of the preſent age, on a ſubject equally futile with that which we are now diſcuſſing, "though he "never could advance his curioſity to conviction," he ſeems at the concluſion of his account to have been, even in oppoſition to his own judgment, "*willing to believe.*" For he ſays, (I uſe his own words, that his opinion may not be ſuppoſed miſrepreſented by a tranſlation) "Ultimo
"jam tandem quæretis a me, ut aperiam an crediderim un-
"quam ulli Chemicorum poſſeſſum fuiſſe tale arcanum?
"Libere reſponderim, Helmontium conqueri, lagenam
"ſemel datam, iterum ablatam ipſi fuiſſe; unde certum,
"non potuiſſe eum tot experimenta illo liquore facere.
"Paracelſus vero tot et talia non ſcribit de ſuis ſolventi-
"bus. Quare vere neſcio, quid de ipſa re dicam. Id pro
"vero dixerim, conſuluerimque, Salem Marinum et Mer-
"curium omni modo chemico tractare, nunquam pæni-
"tebit operæ."

Boerhaavii Chemia, Lugd. Bat. Vol. I. p. 868.

"pervenerit minimum adhuc poterit, niſi "Domini favor benignus affulſerit. En ſic "adolevi, factus vir, nunc quoque ſenex "inutilis, et ingratus Deo, cui omnis ho-"nor."* We may diſmiſs this ſubject by obſerving, that the abſurdity of ſearching for an univerſal ſolvent is well ſhewn by that queſtion of *Kunckel*, "If it diſſolves all ſub-"ſtances, in what veſſel can it be con-"tained?"†

At the ſame time it is but juſtice to the memory of Helmont to acknowledge, that in his writings we find the firſt traces of many important doctrines in phyſiology, pathology and Chemiſtry, which are now generally received. In Chemiſtry particularly he was the firſt perſon who had any idea, or at leaſt who has left any account, of the various permanently elaſtic fluids or gaſes, extricated in different operations. But his knowledge of theſe fluids ſeems not to have had any ſure foundation in experiment, or any other ſupport, than the caſual obſervation of an ingenious man, more intent on framing theories than eſtabliſhing new facts. His obſervations and doctrines were quickly exploded together, and remained for ages buried in the confuſion and obſcurity of his works. It is even probable, though it muſt appear extraordinary, that his writings never ſuggeſted the idea of any of theſe fluids to the philoſophers, who in a later period have again revealed their exiſtence and proved it by experiments. But while on theſe accounts we pay due honor to our modern experimentaliſts, we ought not to refuſe the applauſe, which is moſt juſtly due to the ſagacity of Helmont. *

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* *Van Helmont*, Oper. Studia Authoris, §. 19.

The whole of this chapter is a lively picture of the influence and operation of vanity combined with fanaticiſm on the human mind; and may therefore be conſidered by a contemplative reader not merely as the effuſion of a madman, but as conveying uſeful inſtruction, and preſenting a ſtriking memento, how wild and erroneous are the flights of unreſtrained imagination, and how abſurd the arrogance of intellectual pride.

Of all the paſſages in the writings of the numerous fanatical authors, which may be thought to bear any reſemblance to this prayer and dream of Van Helmont, there is perhaps none more nearly parallel to it, than the celebrated deſcription given by Lord *Herbert* of Cherbury of the ſign he received from Heaven, in anſwer to his earneſt prayer to be certified by ſome particular revelation, that the publication of his treatiſe *De Veritate* would tend to promote the intereſts of religion and the advantage of mankind.

See *Leland*'s view of the Deiſtical writers, Vol.I. p.469. *Biogr. Britan.* Vol. 7. p. 88.

† *Neumann*'s Chemical Works, by Lewis. 8vo. Vol. I. p. 153.

CHEMISTRY, being thus intimately connected with the healing art; and en-

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* *Keir* on Gaſes. Preface. P. XI. XII.
Cavallo on air, &c. Part II. Ch. 4. p. 248, et ſeq.

riched with innumerable diſcoveries in metallurgy and mineralogy, in the preparation of colours, enamel, and glaſs, and in the proceſſes of diſtillation and fermentation, made rapid advances towards perfection. The great ſucceſs of Paracelſus and his diſciples in the cure of diſeaſes convinced the phyſicians of the next age, that the ſolemn Anathémas, which had been pronounced by many celebrated univerſities againſt the chemical doctrines and remedies, enforced in ſome inſtances by the powers of law and even regal authority, * were ſolely the dic-

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* By the univerſity of *Paris* againſt *Quercetan* and *Mayerne*. See Apolog. pro Hippocrat. &c. adverſus *Quercetan.* p.91. and Ad famoſ. Turquet. Apologet. Reſponſio. p.97.

By the ſame univerſity againſt *Ramus* and others; ſee *Launoy*, de variâ Ariſtot. in Acad. Paris. fortun. c. 13.17.

Narrative prefixed to *Pemberton*'s diſpenſatory. P.35.

The following extract, which exhibits the dates of what may be called the revolutions of antimony, the periods when it was conſidered as a valuable medicine, and thoſe when it was regarded as a poiſon, ſhews at the ſame time, how long ſome remains of the ancient prejudice againſt the chemical remedies ſurvived, and how often they were by ſome trivial cauſe called into action. "Never did any remedy meet with ſo inconſtant a fortune, with regard to phyſic, as antimony has done. Scarcely towards the 12th century, came it out of the darkneſs of the mines, by the aſſiſtance of Valentine the monk, when the ill ſucceſs of the experiments made by that artiſt on the unhappy monks his brethren (if the ſtory be not fabulous) made it return thither a long time. Three hundred years after, Paracelſus drew it out a ſecond time, and antimony began to eſtabliſh itſelf; when in 1566 it was

" thundertates of ignorance, pedantry, and prejudice. With minds uninfluenced by preconceived opinions, they could review the practice of the diſciples of Valentine, Paracelſus, and Helmont without envy. They ſaw and acknowledged the extenſive efficacy of the chemical remedies, and endeavoured to diſcover their preparation in the patient path of experiment, whereby thoſe remedies and their virtues had been firſt detected. And as they employed their diſcoveries to the advantage of their contemporaries, ſo they delivered them down in their writings with equal candour and perſpicuity to ſucceeding ages. Theſe authors were ſo numerous, that it would lead me to a greater length, than can be afforded in this place and at this time, to enumerate their particular merits.

Many circumſtances contributed about this period to diſpel that darkneſs, which had

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"thunderſtruck by an arret of parliament, and one Beſ-"nier, a phyſician, in 1609 tranſgreſſing it, was excluded "the faculty. In 1637, by public authority, it was again "received into the number of purgatives. In 1650 a new "arret reſcinded that of 1566, and brought antimony into "reputation. And, on the 29th of March 1668, it had "again the ſanction of public authority, by which gra-"duates had a liberty of making uſe of it, but with a "prohibition to all others, except with their advice."

Savary's Dictionary. I. 109.
Pomet's Hiſt. of Drugs. B. III. Vol. 2. p. 357.
Alſton's Mat. Med. Vol. I. p. 295.

had ſo long overwhelmed the world of letters: and Chemiſtry, equally with the other ſciences, felt the beneficial effects of thoſe cauſes, which conſpired to the revival, and encouragement of every branch of learning. By a free intercourſe with that part of Aſia, which had formerly been poſſeſſed by the colonies of Greece; and more particularly in conſequence of the taking of Conſtantinople,* (when many perſons, who alone retained any knowledge of the Greek language, or poſſeſſed any copies of their original works, took refuge in Europe from the dreaded tyranny of the Turks,) the treaſures of Græcian eloquence and erudition had been gradually laid open. † From theſe refined ſources, men had by ſimilar gradations acquired a more liberal and enlarged mode of thinking. "They recovered the "powers of enquiry and reflection, faculties "of which they ſeemed long to have loſt "the uſe." ‡ And by the art of Printing, which was diſcovered nearly at the ſame time, the facility both of acquiring and propagating the refined ſentiments, the ele-

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* In 1453.

† *Hume*'s Hiſt. of England. Vol. III. Ch. 26. ad finem. *Aikin*'s Biograph. Memoirs. p. 21.

Before this period the language of ancient Greece was almoſt obliterated in Europe, and the Arabian tranſlations were the only means by which any knowledge of Greek literature was preſerved. It is far from my intention to defraud the Arabian tranſlators of any ſhare of their reputation, as the *præcurſors* of the revival of learning. I perfectly accede to the opinion of Mr Warton,[a] and moſt other writers on theſe ſubjects: but the following obſervation of a very eminent hiſtorian, concerning the learning of the Arabians, and the degree, in which they cultivated the ſtudy of the Greek authors, ſeems to be perfectly juſt and well-founded.

"When the Arabians," ſays Dr *Robertſon*, "turned "their attention to the literature cultivated by the ancient

[a] See the reference to Mr *Warton*'s diſſertations, p. 38. of this tract.

"Greeks and Romans, the chaſte and correct taſte of "their works of genius appeared frigid and unanimated to "to a people of a more warm imagination. It was im-"poſſible for them to admire the poets and hiſtorians of "Athens and Rome. But they were ſenſible of the merit "of their philoſophers. The operations of the intellect "are more fixed and uniform, than thoſe of fancy and taſte. "Truth makes an impreſſion nearly the ſame in every "place; the ideas of what is beautiful, elegant, or ſub-"lime, vary in different climates." It may be therefore urged, without any ſuſpicion of prejudice, that tho' the Arabian writers, previouſly to the taking of Conſtantinople, had preſerved in Europe a ſlight knowledge of the Grecian logic, medicine, and philoſophy; even this knowledge, diſguiſed by minute ſubtleties and metaphyſical diſquiſitions, was alſo deprived of the graces of the original language, in which it had been conveyed. From hence it naturally happened, that their tranſlations were but little read, and produced no general effect. At the ſame time the divine works of the hiſtorians and poets of Greece were totally neglected, and ſeemed buried in oblivion; 'till this great event brought them again to light. Then the Genius of ancient Greece appeared in his native, ſimple, and moſt attractive attire, with an influence very ſimilar, and not inferior, to that aſcribed by Tully to the appearance of Virtue in a viſible form, "quæ ſi oculis cerneretur, mira-"biles amores, ut ait Plato, excitaret ſapientiæ." *Cicero* de Off. L. I. C. 5.

‡ *Robertſon's* Hiſt. of Charles V. Vol. p. 169.

gance, taſte, and philoſophy of Greece, was wonderfully increaſed. * The revival of learning by degrees introduced the Reformation of Religion; † and this Reformation ſtill farther encouraged thoſe enlarged views, which the ſtudy of the ancient authors had inſpired. "The human mind was now "rouſed, by irreſiſtable cauſes from the le-"thargy, in which it had been ſunk for ſo "many ages." The ſame ardent ſpirit of inquiry diſplayed itſelf in the exertions of the profeſſors of every ſcience; and the Chemiſts found a new and extenſive field for the employment of their induſtry and zeal in the treaſures of America and the Eaſt, which had been lately revealed to the old world, by the ſucceſsful voyages of Columbus and Gama. ‡

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* See *Robertſon*'s Hiſt. ubi ſup. p. 168, & 169.

† Luther openly declared his oppoſition to the Pope in 1520.

‡ *Columbus* diſcovered the New World on the 12th of October 1492, and arrived, after his firſt voyage, at Liſbon, Feb. 24. 1493.

Gama ſailed from Liſbon on the 9th of July 1497, doubled the Cape of Good Hope on the 20th of November following, on the 22nd of May 1499, he arrived at Calicut on the coaſt of Malabar, and landed on his return at Liſbon, on the 14th of September 1499.

See *Robertſon*'s Hiſt. of America, 8vo. Vol. I. p. 130, et ſeq. and p. 208, et ſeq.

Theſe are to be marked as the periods, when the treaſures of America were revealed, and thoſe of the Eaſt rendered

From this æra the number of Chemiſts, and chemical writers increaſed immenſely; ſo that it would be almoſt impoſſible even to enumerate their names. But ſtill their works were not entirely free from the myſterious jargon of Alchemy. Their theories were obſcured and clouded; and theſe illuſions would perhaps have continued to this day, had not our illuſtrious Countryman, BACON, pointed out the true path of chemical and phyſical inquiry, by diſcountenancing the abſurd hypotheſes which prevailed, and directing men to the true ſource of the knowledge of nature, Experiment. "It has ever been the misfortune of philo-"ſophical Genius," ſays an elegant writer,* "to graſp at objects which Providence has "placed beyond its reach, and to aſcend to "general principles, and to build ſyſtems, "without that previous large collection of "facts, which alone can give them a ſolid "foundation." * * * * * "Genius is na-"turally impatient of reſtraint, keen and "impetuous in its purſuits; it delights there-

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dered more acceſſible to the European nations, tho' many years elapſed before the true value of theſe diſcoveries was known, or the productions of theſe diſtant countries properly examined, and applied to the purpoſes of the arts and medicine.

* *Gregory*'s comparative view. Vol. I. p. 114. ed. 6th.

“ ſore in building with materials, which the “ mind contains within itſelf, or ſuch as the “ imagination can create at pleaſure. But “ the materials, requiſite for the improvement of any uſeful art or ſcience, muſt all “ be collected from without, by ſuch ſlow “ and patient obſervation, as little ſuits the “ vivacity of genius, and generally requires “ more bodily activity, than is uſually found “ among philoſophers.” * But BACON recalled philoſophy from the altitude, to which ſhe was continually ſoaring, and fixed her down to her proper ſtation. He confined her labours to the patient path of experiment; and ſeeing, with a prophetic eye, what a change this doctrine, if purſued, would effect in ſcience, he did not heſitate to prefix

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* The following paſſage in the introduction to the Opuſcula of the celebrated profeſſor *Bergman*, to whom modern Chemiſtry owes great obligations, correſponds with, and will enforce, theſe obſervations of Dr Gregory.

“ Scilicet ab una parte, perquam cara, moleſta et longa “ eſt *via experimentalis*. Hanc igitur non omnium ferunt “ facultates: multis deſunt idonea inſtrumenta: aliis neceſſaria dexteritas: pleriſque ſufficiens patientia et conſtantia; nam, ſi res ſtatim non ſuccedit, faſtidiendo conatum deſerunt. Homo ſibi relictus per naturam otio eſt “ deditus. Ab alia parte *via contemplativa* noſtræ ſciendi “ cupiditati favens, et cito et facilè ſacraria naturæ reſerando, demulcet inexplebile omnia explicandi deſiderium; vanam arrogantiam focillat, omnia noſtro intellectui pervia fingendo.”

Bergman Opuſc. Vol. I. Introd. p. IV. De indagando vero.

to this important ſyſtem the title of *Inſtauratio Magna*: having at length, as he himſelf expreſſes it in his dedication to the King, pointed out the way, by which "poſt tot "mundi ætates, philoſophia and ſcientiæ non "ſint amplius penſiles et aereæ, ſed ſolidis "experientiæ omnigenæ, ejuſdemque bene "penſitatæ, nitantur fundamentis."

The evident truth of this doctrine had an immediate influence on the ſtudy of natural philoſophy and Chemiſtry. Societies of ſtudious and ingenious men were formed, with the profeſſed intention of collecting facts and promoting experimental knowledge. Of theſe none were more early eſtabliſhed, none have obtained a higher reputation, than thoſe of *Paris* and *London*.* Amongſt the eminent chemical authors, who diſtinguiſhed themſelves ſoon after this reformation of the ſcience of nature, the names of *Newton* and *Boyle* deſerve particular notice. The active and comprehenſive mind of Newton,

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Dr *Sprat* ſays, "the Royal Society had its beginning in "the wonderful pacific year 1660, ſo that if any conjec- "tures of good fortune, from extraordinary *nativities*, "hold true, we may preſage all happineſs to this under- "taking." *Hiſt. of the Royal Society*, p. 58. But I believe the date of their charter of incorporation is on the 15th of July 1662.

The Royal Academy of Sciences at Paris was inſtituted in 1666.

found not ſufficient employment in the ſublimer ſciences of geometry and aſtronomy, but inveſtigated with equal ardour the moſt ſecret receſſes of nature by phyſical and chemical experiments. But in the annals of Chemiſtry no name deſerves a higher eulogium than that of Mr. Boyle. Of a mild and amiable diſpoſition, and a delicate frame of body, he was not formed to take an active part in thoſe unhappy tumults, which diſtracted this country during the earlier part of his life. Thus the circumſtances of the times concurred with his own philoſophic temper to induce him to devote his life to literary purſuits, to an inveſtigation of the properties of bodies, the powers and operations of nature, the inventions of art, and all the various branches of ſpeculative and practical Chemiſtry. He was the author of almoſt innumerable tracts, compoſed with equal candour and ſpirit. His ſtyle may perhaps be deemed by ſome incorrect or too diffuſe; but that was leſs his own imperfection than that of the age in which he lived, when a florid and luxurious mode of writing was conſidered as the moſt elegant and expreſſive. * He held an open and candid

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* See the very juſt obſervations of the ingenious Dr *Warton* on the ſtyle of the writers of *Charles the Second's* reign. *Eſſay on Pope.* Vol. I. p. 157.

communication with all the eminent Chemiſts of his age, and while he reſided in this place during the civil wars, he invited the lovers of the ſcience of nature to frequent meetings and literary converſations; and thus formed the rudiments of that celebrated Society, which after the Reſtoration obtained the Royal approbation and patronage, and has ſince held ſo high a rank, and an eſtimation ſo well deſerved, amongſt the literary ſocieties of Europe. † But the attention of the learned in England to Chemiſtry was conſiderably interrupted by *Harvey's* * diſcovery of the circulation of the blood, and by the doctrines and controverſies to which it gave

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† As this Univerſity has had the honour in ſome degree of laying the foundation of a Society ſo juſtly celebrated, it cannot but be regretted that meetings of this kind are ſo little encouraged here. The utility of them cannot be denied: the general diſpoſition of the learned and ingenious in every conſiderable town in this iſland, and on the continent, to form ſuch ſocieties evidently ſhews the pleaſure and advantage, which reſults from them. But we need not look into the world for proofs. Our own ſituation furniſhes one equal to a demonſtration, as the ſeeds of the Royal Society were planted, and grew, and by ſuch careful and tender treatment were foſtered and cheriſhed in this very ſoil.

* *Harvey* publiſhed his doctrine of the circulation of the blood in 1628: and therefore it may be thought extraordinary, that this celebrated event in the annals of medicine ſhould be mentioned amongſt the cauſes which retarded or impeded the ſtudy of Chemiſtry in England forty or fifty years after: but it ſhould be obſerved, that it is only mentioned as a co-operating cauſe, acting in conjunction with other circumſtances, which particularly encouraged mathematical ſtudies in this kingdom, and gave

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to geometry ſo great a pre-eminence over all other ſciences. Soon after Harvey's firſt publication of his work the civil wars, or at leaſt the unhappy controverſies which led to them, broke out: and therefore this extraordinary diſcovery did not for many years ſhew its proper influence on the ſtudies and purſuits of thoſe, who cultivated any branch of natural philoſophy in this country. It was not till learning began to emerge from the obſcurity, which had overwhelmed it during the tumult and diſtraction of the nation, that this influence was experienced. The doctrine of Harvey had been in the mean time violently attacked and oppoſed on the continent, and even in this iſland. The defence, or confutation of it, required a knowledge of the general laws of Hydroſtatics and Hydraulics, and of the forces, by which fluids contained in certain canals, may be propelled in a continual or alternating ſtream, as well as of the reſiſtances, which may accelerate or retard, interrupt or obſtruct, their free courſe. But an acquaintance with theſe laws is intimately connected with the fundamental principles of mechanical philoſophy, of which Geometry is the baſis: it is therefore no unreaſonable aſſertion, that theſe diſputes tended in a conſiderable degree to the encouragement of geometrical ſtudies in preference to all others. It is however certain, that the mathematical doctrines, ſtill farther encouraged by the aſtoniſhing reſearches of Sir Iſaac Newton and ſome others, prevailed ſo univerſally, not only in England, but on the continent alſo, that the ſyſtem of medicine was entirely occupied by them, and the chemical theories almoſt totally excluded. This change eſtabliſhes an 8th æra in the hiſtory of phyſic, the æra of the mechanical dogmatiſm, a period concerning which it is to our purpoſe to obſerve, that its diſtinguiſhing character is the prevalence of the mathematical doctrines, that its introduction is marked by Harvey's diſcovery of the circulation of the blood, and the excluſion of Chemiſtry, and that its concluſion is diſtinguiſhed by Boerhaave's incorporation of the mechanical and chemical ſyſtems into one.

riſe; but ſtill more by the wonderful progreſs of Sir *Iſaac Newton* in the inveſtigation of the laws of the planetary ſyſtem. Hence the ſtudies of aſtronomy and geometry were introduced moſt juſtly into general repute in England: but unhappily, while theſe ſciences were cultivated with the greateſt advantage and ſucceſs, many others were excluded and neglected, as unneceſſary to the perfection of a liberal education. Medicine in a very particular manner felt the influence of this ſyſtem. The doctrines of Chemiſtry were rejected. Not only the theory, but even the practice of phyſic, was conducted and explained upon mechanical or geometrical principles. Chemiſtry of courſe was diſregarded and uncultivated, except by a few retired perſons for their amuſement. But in Germany it had a different fate. Beſides authors of inferior note, *Stahl*, *Hoffmann*, and *Boerhaave*, three of the moſt illuſtrious names recorded in the annals of philoſophy, not only ſuſtained, but advanced the reputation of Chemiſtry to a height, which it required the moſt conſummate genius to attain. The genius indeed of *Stahl* * was exceeded only by his indefatigable induſtry.

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* *Leſlie* on Animal Heat, Ch. II. p. 103.
Dictionary of Chemiſtry, preliminary diſcourſe. P. x.

He ſeems to have taken in at one view the almoſt boundleſs range of chemical phænomena, and by maturely weighing and judicioufly placing them in their proper light, has formed a ſatisfactory theory of many of the moſt important operations of nature. His theory, eſpecially that which relates to fire and the principle of inflammability (formed indeed, it muſt be acknowledged, on the principles of his predeceſſor *Becher* †), has not been invalidated by time, the ſole impartial teſt of ſyſtems : on the contrary, it is every day more and more confirmed by the various advances, which are daily made in Chemiſtry and natural philoſophy. *Hoffmann's* excurſions in the wide field of theory were leſs extenſive. His diſtinguiſhing character, as a chemiſt, ſeems to have been an extreme patience and perſeverance in inveſtigating by experiment the qualities of bodies. We find ourſelves indebted to his labours in almoſt every branch of the ſcience, but principally in the examination of mineral waters. † More modern obſervations have carried this inveſtigation to a greater degree of perfection ; but almoſt the firſt rudiments, from which all the ſubſequent improvements have ſprung, we owe to the induſtry of Hoffmann. While Stahl and Hoffmann thus revealed the arcana of particular diviſions of the great kingdoms of nature, *Boerhaave*, taking a more comprehenſive view of the ſcience of Chemiſtry in its utmoſt extent, diffuſed a new light over every part. He collected the obſervations of all former chemiſts; he examined their theories; he repeated their experiments; he compared them with thoſe of his contemporaries; and having collected an immenſe treaſure of chemical facts, he formed the whole by his uncommonly methodical genius into a moſt perfect ſyſtem, that has long been, and muſt ever continue, the object of univerſal admiration; a ſyſtem ſo perfect, that moſt writers, who have given the hiſtory of Chemiſtry, have concluded their narration with this great name, as if no addition had been ſince made, or could be afterwards expected, in the Science. *

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* Id. ibid.

† *Boerhaave's* Chemiſtry, by Shaw. Vol. I. p. 60. Note x.

But Chemiſtry, being founded in experiment, can have no limitation. We may moſt juſtly uſe of this ſcience the words, which a celebrated ancient writer employed, when ſpeaking of the acquiſitions of learning in his time: "Patet omnibus veritas; nondum "eſt occupata: multumque ex illâ etiam fu"turis relictum eſt. Multum adhuc reſtat "operis multumque reſtabit: nec ulli nato "poſt mille ſæcula precludetur occaſio ali"quid ſemper adjiciendi." * At the very time, when it was ſuppoſed, that Boerhaave had completed the chemical ſyſtem, and had left nothing to poſterity to add to his work but further illuſtrations by the collection of new facts, Dr *Hales* connected the chemical and mechanical principles in his explanation of the phænomena of vegetation, and by a ſeries of moſt intereſting and engaging experiments, laid open a perfectly new path, † and led the way to thoſe curious inveſtigations of the nature of fire and air, which diſtinguiſh the hiſtory of natural philoſophy in the preſent age. Yet ſo great was the attachment of the lovers of learning in England to the ſtudy of the ſublimer parts of geometry, that poſſibly this new path might have been long deſerted and untried; had not the Britiſh parliament, (anxious to ſatisfy the humane deſire of the nation to diſcover a remedy, whereby the excruciating torments attending calculous complaints might be alleviated,) propoſed their premium for the publication of Mrs. *Stephens*'s ſolvent, which in private practice, under her own directions and adminiſtration, had been for ſeveral years productive of the moſt ſalutary effects. * But this grant led the way to

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* *Dictionary of Chemiſtry*, Engliſh, prelim. Diſc. p. xi.

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* *L. Ann. Senecæ.* Epiſt. 64.

"Fundamento jam poſito," ſays Dr *Watſon*, ſpeaking of the progreſs of Chemiſtry, "molem extruxere paululum "recentiores, felici admodum ſolertia; nec ædificio ad"miniculum, nec forma deeſt: faſtigium operi quod in"finitum eſt, nulla ingeniorum ſagacitas, nulla temporum "diuturnitas unquam imponet."

† I have mentioned Dr *Hales* as the introducer of the *New Philoſophy*, tho' I do not mean to deny that both Helmont and Boyle had before taken notice of the elaſtic fluids extricated in various proceſſes, or to aſſert that Hales has in any degree a prior claim to the diſcoveries of *Brownrigg*, *Cavendiſh*, *Black*, or *Prieſtley*, &c. but as M. *Lavoiſier* has obſerved, (*Opuſcules Phyſiques et Chymiques*, Chap. III.) Dr Hales was the firſt perſon who conceived any idea of, or inſtituted any experiments to demonſtrate, the quantities either abſorbed or extricated in ſuch caſes. Dr Hales likewiſe employed much time in analyſing various bodies, particularly the human calculus, and the preparations recommended as Solvents or Lithontriptics; the analyſis

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lyſis of which ſubſtances was greatly aſſiſtant in introducing the experiments on elaſtic fluids. Therefore it certainly may, without violence to truth, be alledged that his obſervations led the way to thoſe later diſcoveries in Chemiſtry, which are connected with them by a chain ſo regularly continued. See more on this ſubject in the next note.

* As this celebrated medicine has been the object of ſo much attention and diſpute, and has produced ſuch important conſequences in Chemiſtry and medicine, a few obſervations relative to its diſcovery and publication may not be impertinent.

Mrs *Joanna Stephens*, the daughter of a gentleman of good eſtate and family in Berkſhire, about the year 1720, accidentally met with a receipt for the ſtone, conſiſting much altercation in the philoſophical world, ſome ſtrenuouſly maintaining that this boaſted

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of egg-ſhells dried in an oven, and powdered, which ſhe adminiſtered to ſeveral perſons. After ſome trials ſhe began to burn the egg-ſhells; and it was found, that the powder was more efficacious in proportion as the egg-ſhells were more burnt. She afterwards found it advantageous to add the aſhes of ſome burnt vegetables, a decoction of herbs, and a little alicant ſoap. The reaſons for theſe additions and alterations it is not within the compaſs of my preſent intention to ſuggeſt. I am only giving an outline of the hiſtory of this diſcovery, as of a remarkable æra in the annals of Chemiſtry. This improved compoſition ſhe uſed many years with great ſucceſs. Her reputation increaſing conſiderably, in the year 1735 the *Hon. Ed. Carteret* began her medicines, and received ſuch ſignal benefit, that the attention of the public became excited and engaged. In 1737 the cures performed by her were ſo many, and ſo well atteſted, that the ſpeedy publication of them was judged to be of great importance to mankind. And accordingly in 1738, a propoſal for raiſing 5000 *l.* by contribution, as a reward to Mrs *Stephens* for diſcovering her medicines, was made to the public with her conſent. (See a liſt of the contributors, at the end of *Hartley's* view of the evidence for and againſt Mrs Stephens's medicines.) But as this propoſal did not meet with ſucceſs, ſhe was adviſed to apply, in the year 1739, to the Houſe of Commons by petition for the abovementioned reward, ſubmitting her medicines, when diſcovered, to ſuch examination, as the houſe ſhould think fit, before the payment of the reward. The bill paſſed both houſes, and had the Royal aſſent, June 14. of the ſame year. She preſented a paper, containing her method of preparing and giving her medicines, on the 16th to the Archbiſhop of Canterbury (the firſt named of a committee compoſed of the great officers of ſtate, the cenſors of the college of phyſicians, and ſeveral other eminent phyſicians, ſurgeons, and natural philoſophers). This paper was publiſhed in the Gazette, by order of the committee, June 19. On the 5th of March 1740, the truſtees, convinced that ſufficient trials had medicine was not a ſolvent of the ſtone, others affirming that there had been given

had been made, and ſatisfactory proofs adduced, both of the efficacy and even of the ſolvent power of the medicines, ſigned the certificate required by the act of parliament, and on the 17th of March following ſhe received the reward of 5000 *l.* from the exchequer.

Supplement to *Hartley*'s preſent ſtate of the evidence, &c.

Mrs Stephens never aſſerted, that this medicine was of her own invention. It was probably borrowed from ſome old family-receipt book. And, not with an intention to detract from that degree of merit, which may be thought to belong to her, it may be obſerved, that the uſe of all the ſubſtances, recommended in her preſcriptions, had been pointed out by numerous authors long before, though not exactly in the ſame form, as efficacious in diſeaſes of the kidneys. Thus *Gerard* ſpeaks of the diuretic, nephritic, and lithontriptic virtues of all the vegetables, which are received either into her pills or her decoction. (See *Hartley*, uti ſup.) It may be ſaid, that he does not direct them to be burnt, but this hint might be borrowed from ſome other author, when once the idea was adopted, that in any ſtate of preparation they poſſeſſed ſuch virtues. *Boerhaave* remarks (*Chemiæ*, Vol. 2. p. 53.) that *Baſil Valentine* prepared a medicine for the gout and ſtone from the aſhes of burnt vine twigs in preference to any other alkali, which plainly ſhews that an opinion of the efficacy of alkalies in this intention was not of modern date. And indeed *Sennertus*, in his diſſertation *De Calculo*, (*Sennerti* Op. Vol. II. p. 1100) beſtows very high encomia on a Liquor Nephriticus made with ſalt of white tartar. We are informed alſo by Dr *Rutty* (ſee *his account* of ſome experiments on Mrs Stephens's medicines, p. 13.) that *Hermannus* long ago remarked the virtue of quicklime in caſes of the gout and the ſtone: and *Van Swieten* (Comment. in Boerhavii Aph. Vol. V. p. 314.) has added to this teſtimony thoſe of *Baſil Valentine*, of *Bartholinus*, and an Engliſh phyſician of the name of *Dickinſon*. The ſolvent qualities of alkalis and quicklime being once admitted, the addition of ſoap to the compoſition was naturally ſuggeſted, both from its the moſt indiſputable proofs of its efficacy. It is not my deſign to enter upon the diſcuſſion of this queſtion. I only mention it to obſerve, that theſe diſputes were productive of more beneficial effects, than uſually reſult from ſuch cauſes, and tended greatly in their conſequences to the revival of the ſtudy, and the enlargement of the objects, of Chemiſtry. Several ingenious men, who took no intereſt in the diſpute, except as far as it was connected with medicine and Chemiſtry, proſecuted an analyſis of the compoſition itſelf, and having diſcovered that its moſt efficacious ingredients were alkaline ſalt and calcined calcareous earth, they were inſenſibly led into a more minute examination of the nature and qualities of theſe ſubſtances, and the properties upon which their

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eſtabliſhed reputation as a menſtruum and detergent, as alſo from the knowledge of its compoſition, in which a large quantity of alkaline ſalt, and perhaps ſometimes a little lime, is covered and guarded with a ſoft bland oil.

This imperfect hiſtory of Mrs Stephens's medicine will not be thought ſuperfluous, if it be recollected that to this medicine we owe in no ſmall degree the experiments of *Hales* on Calculi, and the ingenious tracts, on the ſame or analogous ſubjects, of *Hartley*, *Rutty*, *Whytt*, *Alſton*, and many others, which led the way to the obſervations of *Brownrigg*, *Black*, *Cavendiſh*, *Prieſtley*, and almoſt all the writers of the preſent day, who have enriched the collections of philoſophy with their invaluable experiments on air and elaſtic fluids.

chemical and medicinal powers may be ſuppoſed to depend. This inquiry introduced that ſeries of experiments, which have immortalized the names of *Brownrigg*, *Cavendiſh*, *Black*, *Macbride*, *Prieſtley*, and many other ingenious perſons of our own country, to whom Chemiſtry owes almoſt infinite obligations; and thoſe of *Venel*, *Lavoiſier*, *Scheele*, *Bergman*, *Fontana*, *Volta*, *Ingenhouſz*, and many other illuſtrious foreigners. At the ſame time, that one branch of Chemiſtry has received ſo great additions and improvements, the ſcience in general has been introduced into more univerſal repute and regard; and every branch has received a proportionable ſhare of cultivation and advantage. And the more this ſcience has been cultivated, the more has its connexion with all thoſe arts, which have a moſt material influence in human life, been diſcovered and acknowledged. As this union of Chemiſtry with the arts immediately connected with all the comforts and neceſſities of life, has been before inſiſted upon at large, I need not recapitulate, even in the abſtract, what has been already advanced: yet I cannot conclude without congratulating you on the advantages, which we of this age enjoy. The ſcience, which we wiſh to cultivate and to recommend, is now diſtinguiſhed every where by peculiar and partial favour. The taſte of the age for philoſophy in general; the protection of princes; the zeal of many eminent, intelligent, and independent perſons, attached not by profeſſion, but by inclination, to the ſcience; the ſkill, the ardour, and the integrity of modern chemiſts ſeem to promiſe the greateſt and the moſt brilliant diſcoveries. * You have thus ſeen, traced out in a regular hiſtorical plan, the origin of Chemiſtry from neceſſity; the ſlow and obſcure increaſe, which it received from avarice; and the quick advances, which it made towards perfection, when it was nurtured by philoſophy and patronized by power.

In this view of the hiſtory of Chemiſtry (though perhaps it may ſtill appear ſufficiently long) I have given only a general outline. I have touched only upon the principal points and have enlarged on theſe diſcoveries only, and their inventors, which have produced ſome memorable revolution in the ſcience. It was impoſſible to pay due honour to the name of every illuſtrious chemiſt, who has enriched the art. Many

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* *Dictionary of Chemiſtry*, Eng. Tranſ. Prelim. Diſc.

names have been omitted, without any intentional diſreſpect, from the contracted nature of the plan; my ſole intention being to give ſuch a view of the hiſtory and progreſs of this ſcience, as might animate my audience to pay a juſt attention to a branch of knowledge, which has been the indirect cauſe of ſome events the moſt ſingular in hiſtory, and is every day productive of advantages the moſt beneficial to mankind. It has therefore a double claim to the favour of thoſe who cultivate literary purſuits either for inſtruction or amuſement, as it furniſhes an ample field for the gratification of that principle, ſo inherent in our nature, the love of novelty; and at the ſame time holds out the proſpect of the moſt ſubſtantial improvements in ſome of the moſt important objects of public and private attention, in the mechanic arts, in medicine, in agriculture, and in commerce.

Fig. I.

The Sun and Gold.

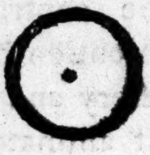


Fig. II.

The Moon and Silver.

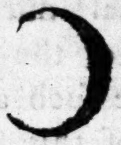


Fig. III.

Jupiter and Tin.

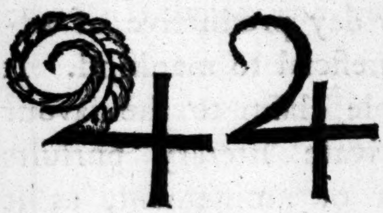


Fig. IV.

Saturn and Lead.

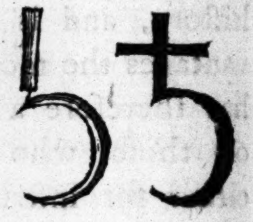


Fig. V.

Mars and Iron.

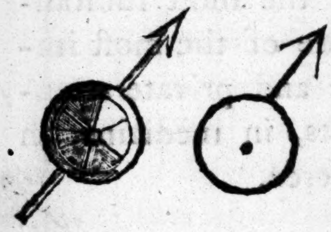


Fig. VI.

Venus and Copper.

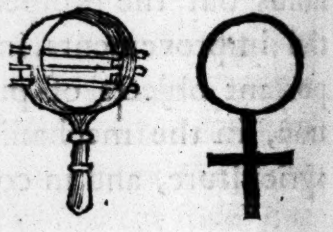
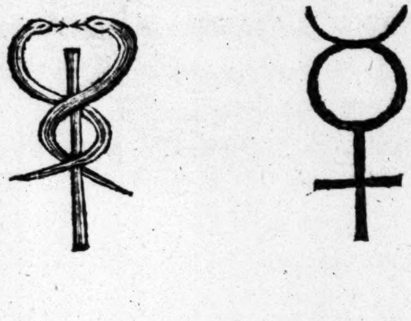


Fig. VII.

Mercury and Quickſilver.



TRACT II.

Conjectures concerning the Origin and Antiquity of the Uſe of Symbols in ASTRONOMY and CHEMISTRY.

THE origin of writing muſt be conceived to be co-eval with the firſt formation of ſociety. I do not here ſpeak of alphabetic writing (the invention of a much later period), but of that mode, in which the ideas of the mind were conveyed, and the tranſactions of men recorded, by actual, though rude, repreſentations or pictures. The inveſtigation of this ſubject has given employment to many able men, * and much ſatisfactory information may be ob-

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* See particularly the Origin and Progreſs of the Sciences by the Preſident *Goguet*, Eng. Tranſlat. Vol. I. p. 174.

tained

tained from the peruſal of their learned reſearches, by which the progreſs of this method of writing has been traced in the early hiſtories of almoſt all nations, previous to the introduction of alphabetic characters. We cannot be ſurprized therefore to find ſome traces of this firſt mode of writing in the records of thoſe ſciences, which have any pretenſions to great antiquity; or that the uſe of them ſhould be adopted in other arts, which aſpire to the ſame reputation of primeval invention. Thus the uſe of ſymbolical characters has been admitted into the ſciences of Aſtronomy and Chemiſtry. It is not my intention to enter into a diſquiſition concerning the origin of ſymbolical, or as they are frequently called from their application in religious rites and on ſacred monuments, hieroglyphic characters, any farther than to ſhew in ſome degree the reaſon of their introduction into theſe two ſciences, and particularly that, which is the peculiar object of my profeſſion.

Whoever engages in chemical purſuits, and in the ſtudy of chemical authors, cannot but remark with ſome degree of curioſity, how extenſively the uſe of ſymbols has prevailed in this ſcience. He is naturally led to inquire from whence this practice originated;

and whether the characters employed are merely arbitrary, or have any relation, real or imaginary, to the ſubſtances repreſented by them. That many of theſe ſigns are entirely arbitrary is commonly ſuppoſed by thoſe, whoſe acquaintance with ſuch writers is ſlight and ſuperficial: but the enthuſiaſm of more perfect Adepts, whoſe reading and experience has been more extenſive, has ſuggeſted a very different idea. Every character is by them imagined to convey an accurate deſcription of the moſt eſſential quality of the ſubſtance which it repreſents.

It is impoſſible to advance very far in our inquiries on this ſubject; but perhaps ſome little light may be thrown upon it by an examination of the probable origin of the uſe of thoſe few characters, which are common both to Aſtronomy and Chemiſtry.

It is well known that the ſigns, by which the chemiſts diſtinguiſh the ſeven principal metals, are by aſtronomers applied to denote the ſeven planets. If then it could be ſhewn, that theſe ſigns were uſed in the ſcience of aſtronomy long before the chemiſts adopted them, it perhaps might be inferred with juſtice, that they were not ſuggeſted to the latter by any direct connection between the ſymbols and the ſubſtances ſignified by them:

but

but that they were firſt borrowed, for the ſake of myſtery, from the aſtronomers, and being thus introduced, probably led the way to the arbitrary invention of many others; which therefore do not admit of any explanation as being entirely the offspring of caprice.

Though the inveſtigation of this point may appear to ſome more ſpeculative than uſeful, yet I hope it will furniſh both inſtruction and amuſement, and therefore I preſume to offer the following obſervations concerning it.

In the firſt place, it may be inquired upon what foundation the Chemiſts build their claim of priority in the uſe of theſe characters. Their advocates anſwer, that the characters expreſs the qualities of the ſeveral metals to which they are aſſigned, reaſoning in the following manner. *

The character of Gold, is a circle with a point in its center (⊙). A circle was always amongſt the oriental nations aſſumed as the ſymbol of perfection and ſimplicity; and as gold is the moſt perfect and ſimple of metals, its nature is well expreſſed by this figure.

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* A more extenſive explanation of this pretended analogy is given by Dr *Shaw*. See his edition of Boerhaave's Chemiſtry, Vol. I. p. 68.

The character of Silver is a ſemicircle, or ſometimes a double ſemicircle (☽): by which it is implied, that ſilver is only half ſo pure, ſo ſimple, and perfect as gold; but that if it were purged and refined from that impurity which debaſes its virtue, that is, if the inner part were properly applied to the outer, it would have the perfection of gold.

The type of Copper is a circle with a croſs underneath (♀), and denotes, that the body or baſis of this metal is gold, though joined with ſome corroſive ſubſtance; a croſs or part of a croſs being the character uſed by the ancient chemiſts to denote any corroſive or acrimonious ſolvent. Accordingly it has been aſſerted by ſome, that copper of all metals, ſilver only excepted, approaches neareſt to gold, as its colour particularly ſhews; and that it requires nothing but the ſeparation of its corroſive to its perfection.

The ſymbol of Iron (♂) denotes gold at the baſe, but overcome, or, as the heralds ſay, *ſurmounted* with a corroſive quality, which not being ſo conſiderable in quantity as that of copper, and of a more volatile nature, is repreſented by a half-croſs placed obliquely above the circle.

Tin is ſaid to be half ſilver and half corroſive, which is expreſſed by a ſemicircle, and a croſs laterally annexed (♃); and the adepts alledge, that tin approaches neareſt of all the metals to ſilver.

The character of Lead (♄) appears to be that of tin inverted. Here it is ſaid, that although this metal has externally ſome reſemblance to ſilver and tin; yet its corroſive quality is exceedingly powerful, and therefore the croſs is in this figure put in the ſuperior place above the ſemicircle. And to ſhew the propriety of this diſpoſition, the alchemiſts obſerve, that lead by its corroſive property is moſt eminently uſeful in the ſcorification of the imperfect metals, and in the refinement of gold and ſilver.

The ſymbol of Mercury is compoſed of the circle of gold in the middle, the ſemicircle of ſilver above, and the croſs at the bottom (☿); which combination expreſſes that it is intrinſically gold, as its weight ſeems to prove, but that it has externally the appearance of ſilver, and in reality the properties of neither: hence its purity is ſuppoſed to be debaſed by a corroſive property almoſt inſeparably adhering to it; but if it could be ſeparated, mercury would become gold.

It is hardly requiſite to remark, that this explanation of theſe ſymbols has an immediate connexion with the doctrines of the alchemiſts, and ſuppoſes a much earlier origin and eſtabliſhment of alchemy, than can be ſupported by any evidence of fact or reaſon, as I have in a former tract attempted to prove.

The pretenſions of the Aſtronomers appear to be founded upon a more ſecure baſis.

It is not perhaps poſſible to produce direct teſtimonies from ancient authors to ſhew, that theſe characters were uſed to diſcriminate the planets in the earlieſt aſtronomical obſervations; but it may be obſerved, that ſome authors, of no mean reputation, have aſſerted that their employment is of very ancient date; and though it cannot be referred to the very firſt ages, it has pretenſions to a degree of antiquity much ſuperior to any plauſible date of the theories of alchemy. Scaliger, in his notes on Manilius, mentions as a proof that theſe characters are of very great antiquity, that we find the ſame ſymbols engraved on many very ancient ſtones and rings.* I am encouraged therefore to advance ſome arguments, which may perhaps render it probable, that they were originally invented and applied in a country, where aſtronomy received in no ſmall degree its firſt cultivation; particularly if I can ſhew, that they have a real connexion with ſome remarkable circumſtances of the philoſophy, mythology, and even religion of that country. It is my intention, after this attempt, to endeavour to point out the circumſtances, which led to their application and adoption in chemiſtry.

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* *Goguet's* Hiſt. of the Sciences. Vol. II. p. 422.

The names of the deities, appropriated by us to the ſeven planets, are evidently Roman. They were, with many religious ceremonies and inſtitutions, borrowed by that people from Greece. It is more than ſimply probable, that the Greeks adopted them from the Ægyptians, as even their own hiſtorians acknowledge, that they derived the names of their gods, and the principal parts of their theology and mythology, from Ægypt. * This opinion, candidly advanced by Herodotus and many other authors, though oppoſed by ſome Greek writers and ſome of more modern date, ſeems now in a great degree to be admitted by all. † It is therefore in the mythology of Ægypt, that we

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* *Herodot. Euterp.* 49, 50, 51, 58, &c.

† *Potter*'s Antiquities, Vol. I. B. 2. Of the Religion of Greece, Ch. 1. *Abbé Pluche* Hiſt. des Cieux, L. 1. Ch. 2. et ſeq.

Banier's Mythol. Eng. Edit. Vol. I. p. 176. Vol. II. p. 158.

muſt ſeek for the origin of the characters that were employed to diſcriminate the planets in the ancient world, and have in later times been admitted into the moſt general uſe.

Aſtronomy was cultivated in all the oriental nations, particularly in Chaldæa, Phœnicia, and Ægypt, in the very earlieſt ages of which we have any record. Not only the uniform appearances of the fixed ſtars, but even the more irregular movements and revolutions of the planets, and their peculiar and characteriſtic circumſtances of colour and ſplendor, were accurately marked and obſerved. It is probable, that the names, which in theſe early obſervations were given to the ſtars and planets, were derived from, or had an immediate relation to, the moſt ſenſible qualities of theſe ſtars. *Scaliger*, and the Preſident *De Goguet*, have enumerated many of theſe appellations. * But the general uſe of theſe names was ſoon superſeded by the gradual diſſemination of the opinions of polytheiſm.

And the idea of a plurality of deities having been once ſuggeſted, it was extremely natural, that thoſe ſplendid bodies, rolling in the immenſity of ſpace by ſuch regular and determined laws, ſhould be conſidered as the habitations of, or conſecrated to, thoſe immortal beings, by whoſe immediate influence and ſuperintendence the affairs of the world were conducted.* It was then, that the names of particular deities were appropriated to the planets, and hieroglyphic characters began to be employed in denoting the poſitions and phænomena of the celeſtial luminaries.

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* See *Scaligeri* Comm. et Caſt. in Manil. edit. *Lutet.* p. 35.
De Goguet's Origin of the Sciences. Vol. I. p. 417, et ſeq.

In the farther inveſtigation of this ſubject, we muſt ſeek for our principal information from the mythology of Ægypt, or thoſe Greek and Roman interpretations, which have obviouſly the ſame origin.

It is indeed very probable, not only that many of the original ſymbols of the Ægyptians are unknown to us, but that the hiſtory of others is obſcured; and even the fables of the deities themſelves confounded by the multiplied inventions of idolatrous ſuperſtition: but though poſitive proofs may not be in my power, a ſufficient foundation for plauſible conjecture may almoſt always be found, at leaſt ſo far as to confirm the point, which I wiſh to eſtabliſh, that the ſymbols of the planets were firſt applied in Ægypt, the very nurſery of aſtronomy, and afterwards adopted in Greece, and more lately at Rome: that theſe ſymbols were formed from ſome well known circumſtance in the hiſtory of thoſe deities, by whoſe names the planets were diſtinguiſhed; and that they were uſed in this ſcience long before they were aſſumed by the alchemiſts.

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* The origin of idolatry is by all theologiſts traced up to an admiration, gradually increaſing to adoration, of the heavenly hoſt, the ſun, moon, and ſtars. See *Leland*, on the Chriſtian Revelation. V. I. C. 3. *Banier*. V. I. B. 6.

In Ægypt the hieroglyphic mode of writing was uſed in the greateſt extent, and connected both with the ſciences and with religion. By this learned people a circle was employed to denote perfection, and particularly the infinite perfection of the Supreme Being, whom they denominated Oſiris. His reſidence they conceived to be in the great luminary of the day; as from thence they perceived the continual emanation of light and heat, the moſt active inſtruments of the bounty of Providence, the principles of beauty, of vigour, of animation throughout the univerſe. Hence, by a very obvious application, a circle came alſo to be employed as the hieroglyphic of the Sun. The form of the creſcent Moon naturally pointed out the ſymbol, by which that planet is always typified; nor was ſhe ſuppoſed to be deſtitute of a divine inhabitant, but was conſecrated as the palace of the wife of Oſiris, the common mother of mankind.

To explain the remainder of the aſtronomical ſymbols upon the ſame principle; it is neceſſary previouſly to remark, that polytheiſm, in its pureſt form, is nothing more than the deification of particular attributes of the Supreme Being, ariſing from the imbecillity of human nature, unequal to the comprehenſion of One All-perfect God.*

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* I am happy to have, coinciding with mine, the opinion of a perſon of ſo much learning as Mr *Bryant*, † from whoſe ſyſtem I ſhall take the liberty of tranſcribing a few lines: " Many learned men have been at infinite " pains to claſs the particular deities of different countries, " and to point out which were the ſame. But they would " have ſaved themſelves much labour, if, before they had " bewildered themſelves in theſe fruitleſs enquiries, they " had conſidered, whether all the deities, of which they " treat, were not originally the ſame; all from one ſource; " branched out and diverſified in different parts of the " world. I have mentioned, that the nations of the eaſt " acknowledged but one deity, the Sun: but when they " came to give the titles of Orus, Oſiris and Cham, to " ſome of the heads of their family; they too in time " were looked up to as gods, and ſeverally worſhipped as " the ſun. This was practiſed by the Ægyptians: but " this nation, being much addicted to refinement in their " worſhip, made many ſubtile diſtinctions: and ſuppoſing

‡ *Bryant*'s Mytholog. Vol. I. p. 305.

The next deviation from the ſimple duty of religion was the deification of illuſtrious perſons or heroes, whom ſuperſtitious traditions repreſented as deities, that came down from heaven for the comfort, inſtruction,

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"that there were certain emanations of divinity, they affected to particularize each by ſome title; and to worſhip the deity by his attributes." I ſhould be tempted to make a larger extract from this chapter, if I did not recollect, that the work is ſo well known, and ſo highly eſteemed, that it would be needleſs. I ſhall only therefore refer to this chapter, as containing ſufficient proofs of the indentity of, at leaſt, the Dii majores of the heathen world. The paſſages, which he has cited, ſtrongly corroborate my ſentiments, but they need not be again introduced. There is a paſſage in *Cicero*'s works, not noticed by Mr *Bryant*, which ſeems to prove plainly, that Jupiter and the Sun were conſidered as the ſame deity by the wiſer part of mankind even in the days of *Ennius*, though in ſpite of their knowledge and conviction they were led away by the extravagant abſurdities of idolatry. "Tum Lucilius, ne egere quidem videtur, inquit, oratione prima pars (ſc. the exiſtence of the gods). Quid enim poteſt eſſe tam apertum, tamque perſpicuum, cùm cœlum ſuſpeximus, cœleſtiaque contemplati ſumus, quàm eſſe aliquod numen præſtantiſſimæ mentis, quo hæc regantur? quod ni ita eſſet, quî potuiſſet aſſenſu omnium dicere *Ennius*.

"*Aſpice hoc ſublime candens, quem invocant omnes, Jovem*, illum vero et Jovem, et dominatorem rerum, et omnia nutu regentem, et, ut idem *Ennius*,

"*Patrem Divûmque hominumque*, et præſentem ac præpotentem deum. Quod qui dubitet, haud ſane intelligo, cur non idem, ſol ſit an nullus ſit, dubitare poſſit."

Cicero De Nat. Deorum, L. II. 2.

See alſo the *Abbé Banier*'s account of the univerſal worſhip of the ſun, and particularly of the indentity of that deity under all the various appellations of the heathen gods. *Banier*'s Mythology, Eng. Edit. Vol. I. p. 182 and 484.

and protection of men. * In the explanation of the remaining ſymbols we ſhall find traces of both theſe ſyſtems of idolatry; and in general we ſhall have occaſion to remark, that ſeveral opinions concerning the planets, and the deities to whom they were conſecrated, which had their origin from the firſt ſyſtem, were in after times, long after, explained by the ſecond.

Hence we are not ſurprized to find, that the two planets, diſtinguiſhed by a ſplendor neareſt to that of the ſun and the moon, were alſo ſuppoſed to be inhabited by, or at leaſt were conſecrated to the ſervice of, the two chief deities under a different form and name. One of theſe planets is called Jupiter; and probably derived both its name and its ſymbol from that part of the Ægyptian mythology, which aſſerted, that when the gods in the war with the giants fled from the wrath of Typhon into Ægypt, they concealed themſelves in the forms of various beaſts, under which they were afterwards

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* *Leland* on the Chriſtian Revelation. Vol. I. P. 1. Ch. 3, 4. *Montfaucon*, (and other authors,) ſpeaking of the gradual introduction of idolatry into Ægypt, expreſſes doubts, whether it prevailed with all its attendant pomp and abſurdity before the time of Moſes. *Montfaucon.* Tom. II. p. 2. L. 1. C. 1. See alſo *Leland* Ch. Rev. Vol. I. P. 1. Ch. 2. particularly, p. 71.

worſhipped in that country; and eſpecially Jupiter, under that of a ram, at the celebrated Libyan temple of Hammon.* To this circumſtance Lucan alludes in his deſcription of the march of Cato, and his viſit to this temple,

Ventum erat ad templum, Libycis quod gentibus unum
Inculti Garamantes habent: ſtat certior illic
Jupiter, ut memorant, ſed non aut fulmina vibrans,
Aut ſimilis noſtro, ſed tortis cornibus, Hammon.†

And Ovid ſtill more diſtinctly in his account of the wars of the gods,

Bella canit Superûm; falſoque in honore gigantas
Ponit, et extenuat magnorum facta Deorum;
Emiſſumque imâ de ſede Typhoëa terræ
Cœlitibus feciſſe metum, cunctoſque dediſſe
Terga fugæ: donec feſſos Ægyptia tellus
Ceperit, et ſeptem diſcretus in oſtia Nilus.
Huc quoque terrigenam veniſſe Typhoëa narrat,
Et ſe mentitis Superos celaſſe figuris:
Duxque gregis, dixit, fit Jupiter; unde recurvis
Nunc quoque formatus Libys eſt cum cornibus Hammon‡

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* *Herod.* Euterp. 42.

† *Lucan.* Pharſal. IX. 511.

‡ *Ovid.* Metam. L. V. 313. See alſo *Lucian* de Sacrificiis, ad fin. *Luciani* Op. Bourdelotii. 186, 187. Repreſentations of Jupiter Hammon with theſe inſignia are very common:

As Jupiter therefore was ſo often worſhipped under the form of a ram, or a figure with a ram's head, or at leaſt wearing the horns of a ram; it is not improbable, that the ſymbol of this planet (ſee Fig. III. in the Plate. p.88.) was taken from theſe repreſentations. It might originally be the perfect head of a ram, or only one horn. The croſs annexed to it may be a remainder of the outline of the reſt of the head; or, with more probability we may imagine, it was annexed at firſt to convey ſome particular information, and was afterwards retained in the figure, though the intention of its firſt application was forgotten. The Ægyptians, we are told, * expreſſed the different ſtages of the inundation of the Nile, by expoſing columns

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common: See particularly *Montfaucon Antiq.* Tom. I. Pl. 14. and Supplement, Tom. I. Pl. 20. *Muſ. Florent.* Vol. II. Pl. 53. No. 4, 5, 6, 7. *Hunter*'s Medals, T. 23. *Les Pierres Graveés* de Monſ. le Duc d'Orleans, Vol. I. Pl. 6. p. 25. There is a ſtatue of Jupiter Hammon in one of the niches on the ſtair caſe at Lord Pembroke's at Wilton, ſaid to have been brought from a temple in Thrace, which was built by Seſoſtris. It has not only a ram's horns, but a ram on its ſhoulders.

* *Abbé Pluche* Hiſt. des Cieux, L. I. Ch. I. §. 8.

Banier likewiſe obſerves, that a croſs is frequently a part of the ſymbols of the Ægyptian divinities, as appears from figures and obeliſks ſtill remaining; and he mentions, that in the celebrated *Menſa Iſiaca*, both Oſiris and Iſis have ſuch croſſes in their hands.

Banier's Mythol. Eng. Edit. Vol. I. p. 563.

or poles, with one or more croſſes upon them. And this croſs was ſometimes connected with other ſymbols to repreſent ſome other circumſtance, either of the ſeaſon, or the ſituation of the planets, which concurred with the inundation. Hence perhaps we ſee it annexed not only to this of Jupiter, but alſo to the ſymbols of Venus, Saturn, and Mercury. *

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* As Jupiter was repreſented under this form, the horn of the ram came to be conſidered as the enſign of honour and power, and was aſſumed as an imperial diſtinction by many princes. Hence we ſee theſe ornaments on ſome of the medals, &c. of Alexander the Great, † who took particular pains to be thought the ſon of Jupiter Hammon; and conſidering his anxiety on this point, it may be wondered that we do not find them on more: but it ſhould be remembered, that, though he wiſhed to propagate this opinion among the oriental nations and in India, he was not very deſirous of preſſing the notion of his divinity on his græcian ſubjects; Τοις δε Ἑλλησι μετριως και ὑποφειδομενος ἑαυτον εξεθειαζεν. ‡ ſays *Plutarch*: and indeed it appears from a paſſage in *Curtius*, that he could not with ſafety urge this vain ambition to any great extent in Greece, as even his own Macedonians derided his folly, "Et Mace-"dones, aſſueti quidem regio imperio, ſed majore libertatis "umbra quam cæteræ gentes, immortalitatem aſſertan-"tem contumacius, quam aut ipſis expediebat aut regi, "averſati ſunt." § Theſe circumſtances may ſufficiently explain, why theſe honours of Ægypt are rarely ſeen on his græcian medals.

In all the medals of Lyſimachus, one of the immediate ſucceſſors of Alexander, we ſee the Cornua Ham-

† *Goltzii* Numiſm. Græc. Tab. 31. and *Nonnii* Comment. in hoc opus. p. 177.

‡ In Vit. Alexand. *Plutarch*. Op. omn. fol. Francofurt. 1519. T.I. p 651. A.

§ *Q. Curt.* Lib. IV. 31.

That brilliant planet, which we call Venus, was alſo conſidered as ſacred to the Queen

monis aſſumed.† Lyſimachus reigned in Thrace: and, from what has been ſaid above, it appears that the worſhip of Jupiter Hammon was introduced into that country very early by the Ægyptian conqueſts, and prevailed to a very late period. †

There are alſo ſome medals of Marc Antony diſtinguiſhed by theſe inſignia: ‡ but theſe are not common, and were probably ſtruck in Ægypt, when he gave himſelf up entirely to the influence of Cleopatra, abandoned the Roman habits and marks of nobility, and aſſumed the veſtments and honours of Ægypt or his other oriental dominions.

The horns of different animals were indeed very anciently conſidered in the kingdoms of the Eaſt, as emblems of power and dominion. So many examples of this occur in the ſacred writings, that it is not neceſſary to enumerate them, or to cite any particular inſtance. The late Bp of Briſtol § has adopted the opinion of Ezechiel Spanheim (advanced in his work, De præſtantia et uſu Numiſmatum antiquorum), "that the ſource of this figure of horns "for kingdoms, muſt be derived from the oriental lan-"guages, in which the ſame word ſignifies a horn, a "crown, power, and ſplendor." Is not this a proof, that theſe figurative expreſſions were really derived from, or nearly connected with, the hieroglyphic language of the earlieſt times, and thus with the very origin of the ſymbols of aſtronomy, which is the object of our preſent inquiry? Certain it is, however it may be explained, that the horns of the ram are more frequently choſen as this emblem, than any other; and that the animal itſelf was in ſeveral countries regarded with peculiar veneration. The horns of the ram are Daniel's type of the united king-

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[*] *Goltzii* Numiſm. Tab. 36. Pl. 7. and Tab. 37. Pl. 1. *Numiſm. Pembrochian.* Part. I. Pl. 2. and Part. II. Pl. 65. *Muſ. Florentin.* Vol. II. Pl. 23. Vol. IV. Pl. 1.

[†] The illuſtrator of the Duke of Orleans' Gems, mentions alſo, that the Ptolemys ſometimes aſſumed this Hammonian diſtinction. *Pierres Gravées* de Monſ. le Duc d'Orleans, Vol. I. p. 29.

[‡] *Cooke*'s Med. Hiſt. Vol. I. Pl. 7.

[§] *Newton* on the Prophecies. Vol. II. p. 25.

doms

of Heaven, by the Ægyptians named Iſis, and known by almoſt innumerable other appellations in different countries. It would lead me into the depths of mythology to prove that the goddeſs intended by all theſe various titles was the ſame; and that the Venus of the Greeks and Romans was the Iſis of the Ægyptians, whom we have already ſeen worſhipped as the regent of the moon and the directreſs of the order and productions of the ſeaſons, again celebrated as the more immediate ſource of animal fertility.[*] Accordingly the

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doms of Perſia and Media.[†] "It is obſerved," (ſays Dr. Newton [‡]) "in the preface to Mr Mede's works, that it "was uſual for the king of Perſia to wear a ram's head "made of gold, and adorned with precious ſtones inſtead "of a diadem (Ammian. Marcellin. Lib. 19. C. 1.). Bp "Chandler and others further obſerve, that rams heads "with horns, one higher and the other lower, are ſtill to "be ſeen on the pillars at Perſepolis (Chandler's Vindica"tion, Ch. 1. Sect. 4. Wetſtein in Rev. xiii. 11.)" It may be added in illuſtration of this ſubject, that the ram is the firſt conſtellation of the zodiac; and it cannot be ſuppoſed, that this animal was aſſumed as the firſt ſign without any meaning, and fixed in this diſtinguiſhed place of the ſun's orbit, in *the firſt houſe*,[‖] from whence the courſe of that luminary was ſuppoſed to commence.

[*] At fæcunda Venus cunctarum ſemina rerum
Poſſidet. *Lucan.* Pharſal. Lib. 10. 205.

Innumerable are the proofs, which the induſtry of late mythologiſts has collected, to ſhew the identity of Juno, Luna, Diana, Aſtarte, Aſhtaroth, and Venus. See *Bryant's*

[†] *Daniel* viii. 20.

[‡] *Newton* on the Prophecies. Vol. II. p. 27.

[‖] *De Goguet* Orig. of the Sciences, Vol. II. Diſſert. 1. ad finem.

aſtronomers aſſumed as the ſymbol of this planet the Siſtrum of the goddeſs Iſis, which, we are told by antiquarians,* was a ſmall round or oblong circle of metal croſſed by iron rods with a handle, by which it might be held (ſee the plate Fig. VI. p. 88.), and that it was uſed at their feaſts to mark by an exact cadence the movements of the ſongs and the dance. There was therefore a peculiar propriety in aſſuming this inſtrument as the ſymbol of that planet, which was ſuppoſed to be the reſidence of the goddeſs of mirth and love; and ſo often appears in its greateſt ſplendor and beauty in thoſe evening hours, when the labours of the day give

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Mythology, Vol. II. p. 341. *Montfaucon*'s Antiq. Tom. I. Part 2. Ch. 2. *Abbé Pluche* Hiſt. des Cieux, Ch. 2. § 11. *Montfaucon* ſpeaking of the Ægyptian idolatry and of the identity of Iſis and Venus &c. adds,

"C'eſt ce que a donné lieu de l'appeller *Myrionyme*, la "Deeſſe á mille noms."

Tom. II. P. 2. L. 1, 2.

Dr *Potter*, in his Antiquities of Greece, quotes the following ſentence from ſome author, whom he does not name. Την Αφροδιτην ουρανιαν ειναι μητερα ολων. *Potter*'s Antiq. Vol. I. P. 264.

* *Montfaucon* Tom. II. p. 287. its form particularly ſhewn, Pl. 108, 110, 114, 115, 116, 117.

Abbé Pluche Hiſt. des Cieux, Pl. vi. and xvii. and Chap. 2. Sect. 3. *Scaliger*, in his notes on Manilius, ut ſup. ſuppoſes the aſtronomical character of Venus to be borrowed from a mirror with a handle.

place to mirth and joy, the ſong and the dance. *

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* There are many beautiful alluſions in the claſſics to the appearance of this planet, both as a morning and evening ſtar, particularly the latter, when ſhe is often repreſented as leading in her train refreſhment, coolneſs, tranquillity, and love,

——— cum frigidus aera Veſper
Temperat, et ſaltus reficit jam roſcida luna,
Littoraque alcyonen reſonant, et acanthida dumi.
Virg. Georg. III. 336.

Veneriſque ſalubre ſidus. *Luc.* Pharſ. I. 661.

Heſpere, qui cœlo lucet jucundior ignis? &c.
Catull. Carm. Nupt. 24.

Ἑσπερε, τας ερατας χρυσεον φαος Αφρογενειας,
Ἑσπερε κυανεας ιερον φιλε νυκτος αγαλμα, * * *
Χαιρε φιλος· και μοι ποτι ποιμενα κωμον αγοντι
Αντι σελαναιας συ διδου φαος. *Moſch.* Idyll. 7.

Οἷος δ' αστηρ εισι μετ' αστρασι νυκτος αμολγῳ
Ἑσπερος, ὃς καλλιστος εν ουρανῳ ἵσταται αστηρ.
Hom. Il. χ. 317.

There is a parallel ſimile to this in the Æneid, where the ſame planet is deſcribed in her other character of the morning ſtar, with ſome additional circumſtances of great beauty, and as the diſtinguiſhed favourite of Venus,

Qualis, ubi oceani perfuſus Lucifer undâ,
Quem Venus ante alios aſtrorum diligit ignes,
Extulit os ſacrum cœlo, tenebraſque reſolvit.
Æneid. VIII. 589.

As this planet is ſo often ſeen "hovering over the ocean's "brim," either juſt riſen from the waves, or juſt deſcending into them; may not this common appearance and poſition of her have given riſe to the fable of the birth of Venus from the ſea, and of her perpetual preſidency over that boiſterous element?

The character, attributes, and influence of Venus, are enumerated with peculiar elegance in the juſtly admired exordium

In explaining the character of the planet Saturn we meet with another proof, that the different deities of the heathen world had their origin from the deification of the moſt obvious attributes of the One Supreme Being: for as in the former characters we traced the primæval ideas of the divine ſplendor and magnificence, benevolence and mercy; and ſaw him adored as the creator and preſerver

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exordium of the poem of Lucretius, which may be cited as a concluſive proof, that in the attempt above to reconcile the ancient opinion concerning her, as a goddeſs, with the phænomena of the planet, which bears her name, I have taken no very unjuſtifiable liberties.

Æneadum genetrix, hominum divumque voluptas,
Alma Venus, cœli ſubter labentia ſigna,
Quæ mare navigerum, quæ terras frugiferenteis
Concelebras; per te quoniam genus omne animantum
Concipitur, viſitque exortum lumina ſolis:
Te, Dea, te fugiunt venti, te nubila cœli,
Adventumque tuum: tibi ſuaveis dædala tellus
Summittit flores, tibi rident æquora ponti,
Placatumque nitet diffuſo lumine cœlum.
Nam ſimul ac ſpecies patefacta eſt verna diei,
Et reſerata viget genitabilis aura Favoni;
Aëriæ primum volucres te, Diva, tuumque
Significant initum percuſſæ corda tua vi.
Inde feræ pecudes perſultant pabula læta,
Et rapidos tranant amneis; ita capta lepore,
Illecebriſque tuis, omnis natura animantum
Te ſequitur cupidè, quò quamque inducere pergis.
Denique per maria, ac monteis, fluvioſque rapaceis,
Frondiferaſque domos avium, campoſque virenteis,
Omnibus incutiens blandum per pectora amorem,
Efficis, ut cupidè generatim ſæcla propagent.
Lucret. Lib. I. 1.

of the univerſe; ſo in this inſtance we have a demonſtration of the reverence paid to his providence and wiſdom, as the inventor of arts, and particularly of thoſe, without which human life could not ſubſiſt, agriculture and the cultivation of the vine. This ſyſtem ſeems to receive confirmation from a paſſage in the elegies of Tibullus, alluding to the Ægyptian mythology, by which it appears, that in the earlieſt times, that people attributed theſe beneficial inventions to the Supreme Being:[*]

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[*] Primus aratra manu ſolerti fecit *Oſiris*,
Et teneram ferro ſollicitavit humum:
Primus inexpertæ commiſit ſemina terræ,
Pomaque non notis legit in arboribus.
Hic docuit teneram palis adjungere vitem;
Hic viridem durâ cædere falce comam.
Tibull. Eleg. L. I. El. 8. 29.

The lines immediately following ſhew, that the Roman and Græcian mythologiſts conceived the Oſiris of the Ægyptians to be their Bacchus: but probably the doctrine, conveyed in the paſſage above cited, really referred to an older tradition concerning the origin of the neceſſary arts of life, delivered by immediate communication from Heaven to the firſt of men, but afterwards aſcribed to deities, created by fear or gratitude, by ignorance or ſuperſtition.

Bacchus, however his character might afterwards be perplexed and confuſed, was originally only another name for the Sun, that is, Oſiris; as Ceres was for the Moon, or Iſis. This appears from theſe lines,

——— Vos, ô clariſſima mundi
Lumina, labentem cœlo quæ ducitis annum,
Liber et alma Ceres. ———
Virg. Georg. I. 5.

See the Extract from *Bryant*'s Mythology, p. 100.

but afterwards, when idolatry became prevalent, they feigned a diſtinct deity, and recorded his benevolence to mankind by placing in his hand the ſcythe or the ſickle, the emblem of agriculture and harveſt. As the character of this deity comprehended the attribute of ſuperior wiſdom and prudence, he was generally repreſented as an aged perſon bearing the emblem abovementioned: * and the aſtronomers, influenced by the prevailing opinions concerning him, appropriated as his reſidence that planet, whoſe aſpect is dull and pale, its motion ſlow, and its revolution tedious; and choſe, as his ſymbol in the hieroglyphic writings of the ſcience, the Falx,

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* Theſe inſignia of the god Saturn are often mentioned by ancient authors: and the conſtant application of theſe, without an attempt to trace the propriety or origin of them any higher, was a ſufficient reaſon for the aſtronomers, even at a much later period than that alluded to, to aſſume the ſickle as the hieroglyphic of Saturn. *Juvenal*, in alluſion to ſome traditions concerning him, ſays,

——— Priuſquam
Sumſerit agreſtem, poſito diademate, Falcem
Saturnus fugiens —— *Juv.* Sat. 13. 38.

And *Ovid*,

—— Thuſcum rate venit in amnem
Ante pererrato Falcifer orbe deus.
Ovid. Faſt. L. I. 233.

Repreſentations of this deity, agreeable to this deſcription, are common on ancient medals, &c.

See *Montfaucon*'s Antiq. Tom. I. Pl. 5. and *Muſ. Flor.* Gemm. Vol. III. Pl. 40.

with which their ſuperſtition had already ornamented his images. (ſee Fig. IV. p. 88.)

The deification of Mars * moſt probably had its origin from the ſtrong impreſſions of the divine power and juſtice tranſmitted from the progenitor of the human race to all his deſcendants: but in later times, when a more corrupt ſyſtem of religion had pervaded the world, this adoration was tranſferred through ſlaviſh fear to ſome irreſiſtible tyrant, ſome oppreſſive conqueror, who claimed an apotheoſis by the terror of his arms, and the ſeverity of his victories. The god of war, thus created, was conſidered by aſtronomers as the regent of that planet, whoſe fiery aſpect, † eſpecially when he is

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* Some writers, intimately verſed in the oriental dialects, deduce the very name of this deity in all countries from certain words in the primitive languages, expreſſive of power, ſtrength, might, &c.

Abbé Pluche, Hiſt. des Cieux, Liv. I. Ch. II. §. 20.

Abbé Banier's Mythology, Eng. Tranſ. Vol. II. p. 319.

Mr. *Bryant*, in enumerating the various titles of the ſun, as the Supreme Deity, ſays, that at Petra, he was called Θευσαρης, which is the ſame as Arez. Θευσαρης, τȣτ' εϛι Θεος Αρης, εν Πετρα της Αραβιας. Inſtead of a ſtatue there was Λιθος μελας, τετραγωνος, ατυπωτος, a black ſquare ſtone without any figure. *Bryant*'s Analyſis, Vol. I. 12.

† Hence the epithet πυροεις, which De Goguet inſinuates, was a tranſlation of the original name given by the firſt Ægyptian aſtronomers. Hence too the opinion, thus expreſſed by Lucan, that the winds and thunder were under the direction of this planet,

Habet ventos incertaque fulmina Mavors.

Pharſal. L. 10. 206.

in his perigæon, and in oppoſition to the ſun, correſponds well with the character of that deity by whoſe name he is diſtinguiſhed. * And the ſymbol of the planet was therefore naturally formed from two of the moſt common inſtruments of war, the ſpear and the ſhield. † (See Fig. V. p. 88.)

* *Lucan* gives a very ſtriking deſcription of this planet, perhaps ſuggeſted by his appearance in this ſituation of his orbit, which occurs only once in eight or nine years. The poet is enumerating and explaining in the perſon of Nigidius Figulus, a celebrated aſtronomer, the omens which the heavens preſented previous to the civil war; and amongſt theſe he paints with great ſtrength of expreſſion the dreadful ſplendor of the planet Mars,

——— Tu, qui flagrante minacem
Scorpion incendis cauda Chelaſque peruris,
Quid tantum, Gradive, paras? nam mitis ab alto
Jupiter occaſu premitur, Veneriſque ſalubre
Sidus hebet, motuque celer Cyllenius hæret,
Et cœlum Mars ſolus habet. * * * *
Imminet armorum rabies, ferrique poteſtas
Confundet jus omne manu; ſceleriqne nefando
Nomen erit virtus. *Luc. Pharſal.* L. I. 659.

† It is worthy of remark, that, as *Varro* relates, the Romans worſhipped Mars under the ſimple form of a ſpear, long before they had invented any corporeal form or image of him. *Montfaucon*'s Antiq. Tom. I. B. 3. p. 125.

Mars, ♂. Clypeus Martis cum Haſtâ.
Bellice, depoſitis clypeo pauliſper et haſta,
Mars ades.—Ovid.

Scaliger's Manilius Comm. & Caſt. *Page* 35. Edit. Lutetiæ.

See the celebrated medal of Mars ad Iliam veniens, adduced by Addiſon and Spence to explain the expreſſion of Juvenal in the 11th ſatire, v. 106.

Pendentis Dei ——— *Spence*'s Polymetis, p. 77. & Pl. viii. f. 4. *Sandby*'s Juvenal, Pl. xi. fig. 2.

The aſtronomical ſymbol of Mercury is obviouſly enough deduced from the Caduceus of that deity : but there are ſome particular circumſtances, relative both to the planet and the deity, which differ from all the preceding, and may therefore require a little more time and attention.

It is very improbable, that this planet was diſcovered in the earlieſt æra of aſtronomy; or within that period, when, according to the idea above ſuggeſted, the moſt ſimple form of polytheiſm prevailed, when the idea of the unity of the deity was not totally obliterated, and the different objects of religious adoration were little more than different names of the moſt ſtriking attributes of the Supreme Being. It is generally, and very naturally, imagined, that of the planets Venus was the firſt taken notice of, on account of her extraordinary ſplendor. For a ſimilar reaſon Jupiter and Mars were not long unnoticed, and the diſcovery of theſe might lead to that of Saturn : but Mercury was probably not known 'till long after theſe. The Preſident De Goguet * is inclined to believe, that Mars was found to be a planet next after Venus ; then Mercury,

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* Origin of the Sciences, Vol. I. B. III. Art. 2.

then Jupiter, and laſtly Saturn; an order, which, at leaſt with reſpect to Mercury, cannot be admitted, if we attend to the common phænomena of this planet. Mercury is the ſmalleſt of all the planets: his greateſt elongation from the ſun is not 23 degrees: he is therefore almoſt always obſcured by the ſuperior brightneſs of the ſun's rays, though when ſeen through a teleſcope he appears very bright and ſplendid. There are many perſons, who have never ſeen Mercury with the naked eye, who are well acquainted with the other planets and conſtellations: and as the ancient Ægyptians knew not the uſe of glaſſes, their ſituation was nearly ſimilar. Some little allowance indeed is to be made for the advantages of their poſition on the globe, which is very favourable to obſervations on the planets, both on account of the ſerenity of the climate, and a ſmaller obliquity of the ſphere: whence it is eaſier to diſcern Mercury diſengaged from the rays of the ſun. It was perhaps owing to this advantage, that he was ever diſcovered by them; and it may be reaſonably concluded from the other arguments, that he was the laſt diſcovered of all the planets, and not till long after the reſt.

Having premiſed theſe obſervations, let us return to the hiſtory of the deity, whoſe name is given to this planet. And here I might be led into a very ſubtile diſquiſition; but the fables of this god are ſo complicated, that it requires no common abilities to ſimplify and explain them. I ſhall therefore only venture ſo far, as may be thought neceſſary to my preſent undertaking, and even that with the greateſt caution and diffidence.

Almoſt all mythologiſts agree, that the origin of the fables of Hermes or Mercury muſt be ſought in the hiſtory of Ægypt; that from thence the Greeks and Romans borrowed this deity; who, though they have tranſmitted him to us diſguiſed with innumerable additional attributes or qualities, have ſtill preſerved the moſt eſſential part of his character unaltered, that he was the *meſſenger* and *interpreter* of the gods.

This character of Mercury ſeems to prove demonſtrably, that he is not to be conſidered as a primitive deity (if I may uſe that expreſſion), but as belonging to the ſecond order, that claſs of illuſtrious men, whom gratitude, combining with ſuperſtition, honoured with an apotheoſis.* Upon this foundation we may proceed a little farther in inquiring into his origin and ſymbols.

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* Diodorus Siculus, in his enumeration of the eight *Great Gods* of the Ægyptians, places Hermes laſt, expreſsly

Hermes or Mercury ſeems to have been a common name in the early periods of Ægyptian hiſtory; and perhaps, like that of Ptolemy in later times, and of Cæſar at Rome, having been rendered eminent by the abilities, the genius, or the actions, of one great man, was aſſumed, as a title, by his ſucceſſors in the office, which he had filled. It is poſſible therefore, that the adventures and tranſactions of many perſons may in theſe ſtories be brought together and concentered into one hiſtory. To divide theſe, and to diſtribute the reſpective ſhares of fame and reputation to the proper claimants, is now an abſolute impoſſibility; yet perhaps, from an exact examination of the materials, which have been delivered down to us, we ſhall have ſufficient reaſon to believe, that the moſt ſtriking parts of theſe fables are applicable only to the firſt Hermes.

He was alſo called by the Ægyptians Thoth, Theuth, Taut, Taautes, and Athotes; and is ſuppoſed, by many celebrated mytho-

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preſsly adding, that he was ſo reputed by that people, tho' they were not ſo certain concerning the precedency of the reſt. *Diod. Sic.* L. I.

Banier's Mythol. Vol. I. p. 105.

mythologiſts, to have been Mizraim, one of the ſons of Cham, who with his father and brethren ſettled in Ægypt after the deluge, and taught to his deſcendants thoſe arts, of which they had preſerved by memory ſome traces, when all other monuments of them were obliterated by the univerſal deſolation. He is deſcribed, as the counſellor of Oſiris, the interpreter of the will of the gods, the inventor of laws, * particularly ſkilled in the ſciences, mathematics, geometry, and aſtronomy, † which he applied to the moſt uſeful and ſalutary purpoſes. ‡ He taught his ſubjects the mode of dividing, and aſcertaining the boundaries of, their lands, that their property might not be confuſed by the inundation of the Nile. He inſtructed them to obſerve the motions of the heavenly bodies;

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* *Diod. Sicul.* L. 1. 10. *Banier.* Vol. II. p. 365.

† The exordium of *Manilius*'s work is an addreſs to Mercury, as the inventor of aſtronomy.

‡ From the remembrance of thoſe important ſervices aroſe the various epithets and additions expreſſive of his benevolence and wiſdom, which we find ſo often annexed to his name; thus,

—— ηλθ' εριουνης
Ἑρμειας —— *Hom.* Odyſſ. ϑ. 322.

Ἑρμεια, Διος ὑιε διακτορε, δωτορ ἑαων.
Id. 335.

—— ηδ' εριουνης
Ἑρμειας, ὁς ενι φρεσι πευκαλιμησι κεκαστο.
Hom. Il. υ. 34.

bodies; particularly thoſe, which ſeemed to have moſt connection with the riſing or retiring of the annual flood. Of theſe none was more remarkable than that bright ſtar, which is known to us by the name of Sirius or the Dog ſtar; for its firſt appearance in the morning, after it has been obſcured by the ſun, or, as aſtronomers ſay, its *heliacal* riſing, * preceded at that time the commencement of the inundation only a few days, of which it was therefore naturally conſidered as the præcurſor and monitor. † The gratitude of the people led them to give the name of their great inſtructor to this ſtar, ‡ and alſo to the month correſponding to our September, * when the inundation was riſen to its utmoſt height, and the fertility of the ſucceeding year was determined by thoſe accurate experiments, † which perhaps Hermes himſelf taught them to conduct. The word Thoth or Tayaut ſignifying alſo a dog in the Ægyptian language, ‡ the name of that ſtar was tranſlated into ſome correſponding word in other languages, Κυων, Κυωναϛηρ, Canicula, Canis, the Dog-ſtar. From the ſame ſource alſo ſprung a great variety of Ægyptian hieroglyphic and mythological inventions. Hence

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* The Nile begins to overflow its banks annually a day or two before the ſummer ſolſtice; and, from the earlieſt obſervations of antiquity, recorded by Herodotus, down to the lateſt, which have been made by Pococke and Norden, no material variation has been remarked in the periods of the inundation. Compare *Herodot.* Euterp. 19. *Diodor. Sicul.* Lib. I. 22. De exundatione Nili. *Plinii* Nat. Hiſt. Lib. V. 10. *Lucan.* Pharſal. Lib. X. 219, et ſeq. *Proſper. Alpin.* De Med. Ægypt. Lib. I. C. 8. *Sandys*'s Travels, B. 2. *Norden*'s Travels, Vol. I. p. 55. *Pococke*'s Obſervations on Ægypt, p. 198.

Allowance being therefore made for the motion of the fixed ſtars, which aſtronomers have called the preceſſion of the æquinoxes, it will appear, without a minute calculation, that at the period, to which we are alluding, the heliacal riſing of the Dog-ſtar did precede the ſummer ſolſtice a little time, exactly how long it may not be ſo eaſy to determine.

† *Abbé Pluche*, Hiſt. des Cieux, Vol. I. B. I. C. I. 7.

‡ Id. ibid.

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* *Cicero* de natura Deor. III. 22.

† *Alpin.* de Med. Ægypt. ut. ſupra.

‡ *Abbé Pluche* ut. ſupra.

The Greek name of this ſtar Sirius is by their etymologiſts deduced from σειρω, exſicco, from its ſuppoſed influence in cauſing or increaſing the extreme heat of the ſummer, and deſtroying the verdure of the fields,

——— tum ſteriles exurere Sirius agros :
Arebant herbæ et victum ſeges ægra negabat.
Virg. G. III. 141.

Te flagrantis atrox hora Caniculæ
Neſcit tangere. —— *Horat.* Od. Lib. III. 13.

See more particularly, *Plinii* Nat. Hiſt. L. II. 40, 47. L. XVIII. 28. Others derive it from Siris, an ancient name of the river Nile,

Σιρις ὑπ᾽ Αιθιοπων κεκληται· οἱ δε Συηνης
Ενναεται ϛρεφθεντι μετ᾽ ουνομα Νειλον εθεντο.
Dionyſ. Geographia, Edit. Wells. 489.
See alſo *Plinii* Nat Hiſt. Lib. V. 10.

This etymology connects the name with the ſubject of our inquiry, as the word may then be ſuppoſed to be taken adjectively Σειριος, qu. σειριος αϛηρ, the ſtar of the Siris of Nile.

their images with the head of a dog, Κυνοκεφαλοι and Anubis, and ſometimes Hermanubis, to which in after times they paid divine honours, as their guardian and monitor. * But as the ſuperſtition of the Ægyptians had no limitation, they were perſuaded by their gratitude to conſtitute a different deity from every attribute or quality of a favourite character. Thus they formed another object of adoration from the fable of Hermes, as the *meſſenger of the gods,* and *the interpreter of their will.* They gave him an active elegant form, and the graces of youth; decorated him with emblems of agility and ſpeed, † and placed in his hand the Caduceus, that enſign of office, of magiſtracy, of dominion, which princes, as the vicegerents of the gods, are entitled to ſuſtain.*

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* Latrator Anubis. *Virg.* Æn. VIII. 698. *Propert.* L. III. El. 11. 41. See the account and repreſentations of Anubis in *Montfaucon*'s Antiq. Tom. II. Part II. p. 312, particularly in Plate 128 of that Volume is a figure of Anubis with the Caduceus and a ſphere.

† It is in this capacity, and with theſe inſignia, that we meet with him in the Greek and Roman claſſics, of which the following amongſt many examples may be adduced;

Ἑρμεια, σοι γαρ τε μαλιστα γε φιλτατον εστιν
Ανδρι ἑταιρισσαι, και τ᾽ εκλυες, ᾧ κ᾽ εθελῃσθα,
Βασκ᾽ ιθι, &c. &c.
Ὡς εφατ᾽· ουδ᾽ απιθησε διακτορος Αργειφοντης·
Αυτικ᾽ επειθ᾽ ὑπο ποσσιν εδησατο καλα πεδιλα,
Αμβροσια, χρυσεια, τα μιν φερον ημεν εφ᾽ ὑγρην,
Ηδ᾽ ἐπ᾽ απειρονα γαιαν, ἁμα πνοιης ανεμοιο·
Εἵλετο δε ῥαβδον, τῃ τ᾽ ανδρων ομματα θελγει,
Ὧν εθελει, τους δ᾽ αυτε και ὑπνωοντας εγειρει·
Iliad. ω. 334. & Odyſ. 43.

It was a ſceptre (agreeable to the moſt

Ενθα μοι Ἑρμειας χρυσορῥαπις αντεβολησεν
Ερχομενῳ προς δωμα, νηηνιῃ ανδρι εοικως,
Πρωτον ὑπηνητῃ· τουπερ χαριεστατη ἡβη.
Odyſ. κ. 277.

Sive mutatâ juvenem figurâ
Ales in terris imitaris, almæ
Filius Maiæ. ——— *Hor*. Od. L. I. 2, 41.

Omnia Mercurio ſimilis, vocemque, coloremque,
Et crines flavos, et membra decora juventæ.
Virg. Æn. IV. 598.

Interpres Divum, Jove miſſus ab ipſo.
Id. 356 and 377.

Conſtitit ante oculos, actus velocibus alis,
  Atlantis magni Pleïoneſque nepos.
Fas vidiſſe fuit; fas ſit mihi viſa referre;
  Inque Dei digitis aurea virga fuit.

* * * * * *

Obſtupui, geliduſque comas erexerat horror;
  Cum mihi, pone metum, Nuncius Ales ait.
Ovid. Ep. Paris Helenæ. 61.

And laſtly that moſt complete deſcription of him in the Æneid,

Dixerat. Ille Patris magni parere parabat
Imperio: et primum pedibus talaria nectit
Aurea; quæ ſublimem alis, ſive æquora ſupra,
Seu terram rapido pariter cum flamine portant.
Tum virgam capit, hac animas ille evocat orco
Pallentes, alias ad triſtia tartara mittit,
Dat ſomnos adimitque, et lumina morte reſignat.
Illa fretus agit ventos, et turbida tranat
Nubila. ——— Æneid. IV. 238.

See *Abbé Pluche*'s obſervations on the Caduceus. Hiſt. des Cieux, Vol. I. B. I. Sect. 26.

ſimple and original form of ſceptres,* which were only a ſtrait piece of wood or branch of a tree, afterwards ornamented with various additions either of ſplendor or utility) round which two ſerpents twined. The ſerpent was in a very early period aſſumed as an emblem of wiſdom, and became proverbially ſo in the languages of the eaſt.‡ The ſceptre alone was an emblem of power, and therefore connected, as in the Caduceus, with the ſerpent, was a compound emblem of a good government, ſupported by authority and directed by prudence. And in ſtill later times, when their aſtronomical obſervations detected that planet, which is neareſt to the ſun, they fancied in his movements a great analogy to the character of their favourite Hermes. * Like a faithful meſſenger and ſervant of Oſiris (the Sun) he keeps cloſe to his ſuperior, never moves from him but a ſmall diſtance, and returns again quickly, as if always attentively engaged in the execution of his commands. They therefore conſecrated it to Hermes, and, as its ſymbol in the hieroglyphic writings of aſtronomy, aſſumed the Caduceus. † (See Fig. VII. p. 88.)

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* Ναι μα τοδε σκηπτρον, το μεν ουποτε φυλλα και οζους
Φυσει, επειδη πρωτα τομην εν ορεσσι λελοιπεν,
Ουδ᾽ αναθηλησει· περι γαρ ῥα ἑ χαλκος ελεψε
Φυλλα τε και φλοιον· νυν αυτε μιν υἱες Αχαιων
Εν παλαμης φορεουσι δικασπολοι, οἵτε θεμιστας
Προς Διος ειρυαται· ———

Hom. Il. α. 234.

Ut ſceptrum hoc (dextra ſceptrum nam forte gerebat)
Nunquam fronde levi fundet virgulta nec umbras:
Cum ſemel in ſylvis imo de ſtirpe reciſum
Matre caret, poſuitque comas et brachia ferro:
Olim arbos, nunc artificis manus ære decoro
Incluſit, patribuſque dedit geſtare Latinis

Virg. Æn. L. XII. 208.

‡ "Be ye wiſe, as ſerpents," St. *Matthew*, x. 16. How extenſively a reverence of the ſerpent, and an opinion of its wiſdom, prevailed in the Eaſt, is ſhewn by Mr *Bryant*'s account of the Ophiolatria. See *Bryant*'s Analyſis, Vol. I. p. 473.

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* *Lucan* calls him *Cyllenius celer* (*Pharſal.* L. I. 663.), in another place the ſame poet ſpeaks of him as having an influence on the great water,

—— immenſæ Cyllenius arbiter undæ.
Pharſal. L. X. 211.

Perhaps this part of his character may have a diſtinct reference to what has been ſaid above concerning the connection between the riſing of the Dog-ſtar and the inundation of the Nile; for the Nile was anciently called Oceames or Oceanus. *Diodor. Sicul.* Lib. I. 11.

Some writers have imagined that the fiction of the wings affixed to the cap, feet, &c. of Mercury was ſuggeſted by the rapid motion of the planet which bears that name. *Ovid.* Metamorph. Notis Var. ed. *Cnippingii.* Lib. XI. 312. de Alipede Deo.

† For a more particular hiſtory of Mercury and Anubis, and repreſentations of their images, &c. See *Montfaucon's* Antiq. Tom. I. L. III. 8 and 9. et ſeq. and Supplement. Tom. I. L. III. 6. with the annexed plates, and alſo Tom. II. P. II. L. I. 16. and Pl. 127 and 128.

Whether this attempt to explain the origin of theſe ſymbols be admitted as preferable to that of Scaliger, * or not; it cannot but appear from what has been ſaid both by him and myſelf, that the credit of their invention and prior application muſt be aſcribed to aſtronomy.

I ſhall in the next place endeavour to point out ſome circumſtances, which might induce the chemiſts to appropriate them to their art. As in this application I ſhall be very often obliged to have recourſe to conjecture, I muſt previouſly ſolicit the indulgence and favour of thoſe, who may think theſe diſſertations worthy of their peruſal.

The peculiar ſplendor of the ſun and moon had without doubt been long noticed; and long before the introduction of alchemy (whatever æra of its introduction we aſſume) the language of poetry had diſcriminated the former by epithets borrowed from the analogous brightneſs and colour of gold, that of the latter from the purer white luſtre of ſilver. A few inſtances out of many are in-

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* *Scaliger*'s explanation of theſe characters is as follows, Characteres, quibus vulgo deſignantur Planetæ, ſunt hi; ♄. Saturnus, Falx Saturni. ♃ Jupiter, Fulmen Jovis. ♂. Mars, Clypeus Martis cum haſtâ, ☉. Sol, non indiget explicatione. ♀. Venus, Speculum Veneris. ☿. Mercurius, Caduceus Mercurii. ☽. Luna. *Scaliger*. in Manilium Notæ et Caſtig. Ed. Lutet. 12° p. 35.

ſerted in the margin.* The frequent uſe of theſe epithets might eaſily lead an enthuſiaſtic mind to conceive, that a real analogy and correſpondence ſubſiſted between theſe planets and metals, which by the warmth of a fertile imagination might ſeem to receive confirmation from innumerable circumſtances, and ultimately lead to the employment of the ſame expreſſions for both, and the application of the ſame ſymbolical characters for the metals, which had before been appropriated to the planets. Hence the circle of the ſun was aſſumed as the type of gold; and of ſilver the creſcent of the moon.

The number of the metals known at that time agreeing exactly with that of the planets led to an extenſion of this analogy to the whole: and every metal was eaſily found to have a relation to one or another of the ſeven, and received, as its mark, the aſtronomical character.

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* Aurati Solis Radii. *Virg.* Æn. XII. 64.
Solis aurata corona. *Stat.* Theb. III. 414.
Sol Auricomus. —— *Val. Flac.* IV. 94.
Sol Aureus, —— *Virg.* Georg. I. 232, G. IV. 50.

And *Ovid*, of the chariot of the ſun, ſays,

Aureus axis erat, temo aureus, aurea ſummæ
Curvatura rotæ. —— *Metam.* II. 107.

Niveos Luna levarit equos. *Ov.* Faſt. IV. 374.
Nec candida curſum Luna negat. *Virg.* Æn. VII. 8.
Faveas, Dea candida, dixi. *Ovid.* Leand. Heron. 61.
Fulges radiis argentea puris, *Id.* 71.

Some particular circumſtances, which might give a foundation for theſe ſuppoſitions, ſhall now be mentioned.

Copper was principally, or at leaſt in the moſt conſiderable quantities, found in the iſland of Cyprus; and the manufacture of braſs was not only invented there, but carried on to a degree of perfection unknown in other countries; inſomuch that, we are informed by authors of credit, * either the metal derived its name from the iſland, or the iſland from the metal.

As this iſland was ſuppoſed to be peculiarly under the dominion of Venus, † an

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* “ Fit (nempe Æs) et ex alio lapide, quem chalciten vocant in Cypro, ubi prima fuit æris inventio :

Plin. Nat. Hiſt. L. XXXIV. 2.

To the truth of which aſſertion *Harduin* ſubjoins the following teſtimonies,

Ariſt. Lib. V. Hiſt. anim. Cap. 18. p. 608, Εν δε Κυπρῳ ου η λιθος χαλκιτις καιεται. *Feſtus.* Ærosam appellaverunt antiqui inſulam Cyprum, quod in ea plurimum Æris naſcatur.

† Κυπρος δ' εις αυγας Παμφυλιου ενδοθι κολπου
Κλυζετ' επηρατον αστυ Διωναιης Αφροδιτης·

Dinoyſ. Geog. Ed. Wells, 1240.

O Venus, regina Cnidi Paphique,
Sperne dilectam Cypron. *Hor.* Od. Lib. I. 30. 2.

See

obvious connection was found, which might juſtify the application of the ſymbol of the planet Venus to copper.

The uſe of Iron, in framing the inſtruments of war, formed ſo ſtriking a relation between this metal and the god Mars, that we need not inquire why the character of his planet was aſſumed to diſtinguiſh iron.

The mobility and unfixable nature of the metallic fluid, Quickſilver, was naturally, by minds thus diſpoſed to form analogies, compared with the rapid movements of the planet Mercury; and hence both his name and aſtronomical ſymbol have been appropriated to the metal.

On the other hand, the ſlow motion of Saturn, the coldneſs of his ſituation, ſo far

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See alſo *Hor.* Od. Lib. I. 31. Lib. I. 19. 9. Lib. III. 27. 11.

῾Η δ᾽ αρα Κυπρον ικανε φιλομμειδης Αφροδιτη,
Ες Παφον· ενθα δε οι τεμενος βωμος τε θυηεις·
Ενθα δε μιν Χαριτες λουσαν, και χρισαν ελαιῳ
Αμβροτῳ, οἱα Θεους επενηνοθεν αιεν ἑοντας·
Αμφι δε εἱματα ἑσσαν επηρατα, θαυμα ιδεσθαι.
Hom. Odyſſ. θ. 362.

Ipſa Paphum ſublimis abit, ſedeſque reviſit
Læta ſuas; ubi templum illi, centumque Sabæo
Thure calent aræ, ſertiſque recentibus halant.
Virg. Æn. I. 419.

See alſo the deſcription of the temple of the Paphian Venus, when viſited by Titus. *Tacit.* Hiſt. L. II. 3.

removed from the ſun, and his dull aſpect, (all which obtained him the epithets of frigida, gelida, rigens, and others of like import, *) preſented a reſemblance to the obvious and external, as well as the internal and medicinal qualities, of Lead, ſufficient to countenance the ſuppoſition of a relation between that metal and the planet, and to authorize the application of the ſymbol of Saturn to lead.

The analogy being extended thus far without any great violence, the only remaining ſymbol of Jupiter was applied to Tin, for which the bright ſplendor of the planet and the metal might ſeem to afford a plauſible pretence. † The propriety of this application may perhaps be thought to derive ſome confirmation from the following conjectures.

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* He is called ϛυγνος κρονος by an old Greek poet quoted by *Scaliger*. Caſt. et Not. in Manil. ut ſup.

Summo ſi frigida cœlo
Stella nocens nigros Saturni accenderet ignes.
Lucan. Pharſ. L. I. 651.

Frigida Saturno glacies, et zona nivalis
Ceſſit. Id. L. X. 205.

See alſo *Plin*. Nat. Hiſt. L. II. C. 6.

† Homer diſtinguiſhes tin by the ſame epithet, φαεινος, which he uſes when ſpeaking of the ſplendor of the moon and planets. Compare Iliad. θ. 551, with Iliad. ψ. 361.

Tin was not found in any of the countries of the ancient world, that were commonly known and eaſy of acceſs. It was imported by the Phœnicians from ſome of thoſe regions, where they traded in their remote voyages beyond the pillars of Hercules: particularly it was ſaid to be brought from ſome iſlands, which they call Caſſiterides. Whether the metal received the appellation of Caſſiteron or Caſſiteros, as Homer calls it, * from theſe iſlands, or they were ſo named from the metal, is uncertain; and it is ſcarcely leſs undetermined, what theſe iſlands were, and where they were ſituated. Some place them on the weſtern coaſts of Spain, or Portugal, or Africa. Others ſuppoſe them to have been the Scilly iſlands near the Land's end in Cornwall. † It is not therefore impoſſible, that the Phœnician navigators, who were always particularly ſecret ‡ concerning the place, from whence they obtained the

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* Iliad. ψ. ut ſup.

† In *Wells*'s Dionyſius, v. 1110, it is aſſerted poſitively, that the Caſſiterides were the Scilly iſlands, and that the ancients denominated them from the tin, which they produced. And Dr *Borlaſe* admits this poſition without any doubt, but inſinuates further, that probably the original name was derived from a word in the Phœnician language of ſimilar ſound and import. *Borlaſe*'s Antiq. of Cornwall, Ch. 7.

‡ See *Borlaſe*'s Antiq. Ibid.

tin, might aſſert, that it was diſcovered to them by the God of the ſea, not the Neptune of the Greeks and Romans, of whom the oriental nations * ſeem to have formed no idea, but the more ancient Oceanus, who is often called the Father of the gods, and was in Ægypt, and probably in Phœnicia, certainly in Greece, † frequently confounded with Jupiter; at leaſt the attributes of the latter are very frequently applied by their old writers to the former. Hence the Greeks and Romans might underſtand, that the Phœnicians aſcribed their diſcovery of tin to the favour of the Supreme Being, or as it might be interpreted, Jupiter: which may be thought the more plauſible, if we recollect

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* Particularly the Ægyptians, *Herod.* Euterp. 50. and Melpom. 188. where it is expreſsly aſſerted, that the Greeks and Romans adopted Neptune from Africa, from the inhabitants of the country bordering on the Palus Tritonis near the Syrtis minor, not far from Carthage.

† Ωκεανον καλεω, πατερ᾽ αφθιτον αιεν εοντα,
Αθανατων τε Θεων γενεσιν, θνητων τ᾽ ανθρωπων.
Orph. Hymn. 82.

Ωκεανος θ᾽, οσπερ γενεσις παντεσσι τετυκται.
Hom. Iliad. ξ. 246.

Ωκεανον τε Θεων γενεσιν. Id. 200.

Οσιριν Ωκεανον. *Plut.* in Iſid. et Oſirid.

See this point further illuſtrated in Mr *Bryant*'s examination of the character of the patriarch Noah. *Analyſis*, Vol. II. 251.

that the inhabitants of the Scilly iſlands conſidered themſelves as the offspring of a Deity, who, tho' by ſome confounded with Pluto*, might perhaps by others with more propriety and accuracy be regarded in the ſame light as the Jupiter of the Greeks and Romans, the Father of the Gods.

* *Cæſar* indeed ſays[a], that the Gauls conſidered themſelves, as the deſcendants of Dis or Pluto; and Dr *Borlaſe* has from the authority of this firſt hiſtorian of Britain aſſerted the ſame of the Inhabitants of the Scilly iſlands[b].

It would be preſumptuous to oppoſe my feeble opinion to the teſtimony of writers ſo inconteſtably ſuperior; but, if I might be allowed to propoſe a queſtion on this ſubject, I would aſk, if there is not great reaſon to doubt, whether either the Gauls or the Britons had any idea of the Deity, whom the Greeks and Romans worſhipped under the name of Pluto? And it is hardly probable, if we reaſon from the known principles and general progreſs of idolatrous worſhip, that they ſhould trace their origin up to a Deity, a Prince, or a Chieftain, of whom we find no traces in their religious ſuperſtitions. It is not impoſſible, that Cæſar, perceiving a ſtrong analogy and reſemblance between the dark, inacceſſible, myſterious ceremonies of the Druid worſhip in their conſecrated groves[c], and the ſolemnities, with which Pluto was honoured in his own country[d], might conceive, when they traced their deſcent from the object of theſe extraordinary rites, that they conſidered Pluto as their common father.

To ſhew that this conjecture is not abſolutely inadmiſſible, it may be remarked, that Pluto was a deity (if I may ſo ſay) almoſt entirely Grecian, and yet neither that people nor the Romans accurately diſtinguiſhed his attributes and qualities, for he was often even by themſelves

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[a] *Cæſaris* Comm. de B. G. L. VI. 16.

[b] *Borlaſe*'s Antiq. of Cornwall, Ch. 5.

[c] *Lucan.* Pharſ. III. 399. *Borlaſe*'s Antiq. B. II. C. 17.

[d] *Banier*'s Mytholog. Vol. III. P. 45.

confounded

If it were poſſible to prove, that any traces of ſuch an opinion as this ſubſiſted at the time, when the Alchemical doctrines became prevalent, we ſhould not be at a loſs to determine, why tin was by them diſtinguiſhed by the ſymbol of the planet Jupiter.

Before I conclude, I will take the liberty to mention that in the laſt part of this diſſertation, though I have derived ſome aſſiſtance from the Greek claſſics, I have endea-

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confounded with Jupiter. Thus he is called by titles nearly allied to thoſe of Jupiter, Αγεσιλαος, Αγεσανδρος, *Jupiter Inferus*, *Niger*, *Stygius* and *Dieſpiter*[a]. It is well obſerved by the very ingenious Mr *Burgeſs*, that this laſt expreſſion is not to be deduced, as many etymologiſts incline, from *Diei pater*, but from *Deus* or *Dius pater*[b]. It is obvious too from numerous obſervations collected by *Montfaucon*[c] that the Ægyptians in the character of Serapis confounded the attributes of Jupiter and Pluto. Hence, in conformity to the ſyſtem which has been advanced above concerning the origin and progreſs of polytheiſm, it may be imagined, that theſe various titles, when ſimplified, were only different denominations of the One Supreme Being, aſſumed from the different departments of his univerſal dominion. And therefore when the Gauls and Britons, in a language very imperfectly underſtood by their conquerors, alluded to a remote origin from the object of their myſterious devotion, the Romans diſcovered the character of Pluto in a deſcription, which probably referred to a much higher ſource, ſuggeſted by the univerſally-prevailing traditions concerning the firſt creation of man by the Almighty Word.

[a] *Montfaucon*'s Antiq. Tom. I. L. II. C. 9.
Banier's Mythol. Vol. III. p. 45.

[b] Eſſay on the Study of Antiquities. P. 69.

[c] *Montfaucon*'s Ant. Supplem. T. II. L. vi. C. 6.

voured to draw my illuſtrations principally from the Roman, and thoſe the moſt obvious and familiar authors; ſuppoſing that theſe were moſt likely to be known, if any were known, to the Alchemiſts, and might have ſome influence upon their judgment, when they adopted the ſymbols of the ancient Deities (firſt invented and applied by the aſtronomers to the ſeveral planets) and introduced them into Chemiſtry, as types of the ſeveral metals.

TRACT III.

OBSERVATIONS on the DISEASES prevalent in the SOUTH SEA ISLANDS, particularly the LUES VENEREA, with ſome Remarks concerning its firſt Appearance in Europe.

IT will probably appear extraordinary at this time to revive the diſcuſſion of a ſubject, ſo often debated, and (in the judgment of moſt perſons) ſo ſatisfactorily diſmiſſed; a ſubject, on which ſo many volumes have been written, that it might be well ſuppoſed, there could not remain any room for doubt. This perfect conviction, I imagine, has perſuaded the medical world to paſs over with inattention the obſervations

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After much debate and a great variety of arguments on each ſide of the queſtion, the whole force of the evidence concerning the firſt appearance of the Venereal Diſeaſe ſeemed to have been collected and brought to its proper point of view by Aſtruc. And the medical world, ſince the publication of his work, has almoſt univerſally acquieſced in the opinion, that this diſeaſe is of modern date, that it firſt appeared about the period when Columbus returned from his firſt voyage, and that, previouſly to that date, there is no account of any diſorder which can with truth be claſſed under the ſame denomination. He argues from the ſilence (as far as relates to this ſubject) of the phyſicians, the hiſtorians, the poets, who preceded this period. He explains the few paſſages of ancient authors, which might give any plauſibility to an oppoſite conjecture, and ſhews their relation to diſeaſes of a very different type. He evinces the diagnoſis between this diſeaſe, and the elephantiaſis and lepra of the ancients, with which it had been ſometimes confounded. He gives the moſt authentic narration of real facts concerning its firſt appearance in Europe, between the years 1492 and 1496, and not before. He confutes the arguments of thoſe, who think they can produce facts of an earlier date, eſpecially ſome, which are borrowed from the writings of the ſurgeons of the thirteenth, fourteenth, and the earlier part of the fifteenth, centuries, and more particularly, one of a much later date in the Philoſophical Tranſactions of 1718, the teſtimony of William Becket a ſurgeon at

London, who took great pains to collect all the arguments which could be adduced to prove the antiquity of this diſeaſe, eſpecially from the accounts handed down concerning the *arſura* or *perilous infirmitie of brenning.* He deſtroys the fictions of theory, the offſpring of ſpeculative and fantaſtic imaginations, concerning the origin of this extraordinary calamity.

It cannot be thought neceſſary by thoſe, who poſſeſs the ſmalleſt degree of medical knowledge, to re-produce his arguments, as the work itſelf is ſo popular, that it muſt be familiar and well known to almoſt every ſtudent. I have only ſaid thus much to ſhew, that the opinion of the greater part of phyſicians, that this diſeaſe was perfectly unknown in Europe before the year 1493, has no ſlight degree of foundation.

Of late years the old arguments on the oppoſite ſide of the queſtion have been revived, particularly in conſequence of ſome obſervations made in the voyages to the South Seas.

It is well known, that ſince the peace of 1763, ſeveral ſhips of the Engliſh and French nations, eſpecially of the former, have been ſent into the South Seas with the intention of making phyſical and aſtronomical obſervations, both by land and ſea, in thoſe ſouthern latitudes. The ſailors of theſe ſhips had communication with the women of the new-diſcovered iſlands; and from this intercourſe the Venereal Diſorder made its appearance both in the ſhips and on ſhore. The two nations have, not obliquely, charged each other with the eternal diſgrace of letting looſe the Fiend upon the mild and innocent inhabitants of thoſe iſlands, whoſe hoſpitality deſerved a better return, as their benevolence was free from deceit, and their careſſes the tribute of love and ſimplicity.* It may not be eaſy to vindicate this nation from their part of the charge of this guilt (ſhall I call it) or rather misfortune. Dr Forſter attempts to wipe off the whole of the ignominy by tracing the origin of the

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* "Mox, ubi *Taitæ* vaſto jacet inſula ponto
"Hoſpita terra capit: non illis effera morum
"Aſperitas, ſed blanda quies, atque otia cordi:
"Et faciles nymphas, paſſim per amœna vireta
"Ludentes molli geſtu, cultuque decoro,
"Commendat forma arte carens, et gratia ſimplex."

Theſe elegant lines are extracted from a poem on the ſubject of theſe diſcoveries, which was honoured with the Chancellor's prize at Oxford in 1773, written by Mr Lowth, eldeſt ſon of the Biſhop of London, then Fellow of New College.

By this citation I might be led to offer a tribute of affection and regard to the memory of the amiable writer, which, even thoſe who knew him not, would at leaſt excuſe. Yet why ſhould I revive ſenſations of unavailing regret? why diſorder both in theſe iſlands and in Europe to the remoteſt times, and deducing it from natural cauſes, which have ſubſiſted from a very early period of hiſtory. Before I give any account of this attempt, I ſhall ſhortly ſtate the order in which the ſeveral voyages were made.

The firſt of theſe voyages was made in 1764 by Capt. (ſince Admiral) Byron in the Dolphin man of war, in company with the Tamar frigate. He made very few diſcoveries amongſt the iſlands, to which I allude, and returned in the ſpring of 1766. In the month of Auguſt following, Capt. Wallis in the Dolphin and Capt. Carteret in the Swallow ſailed from Plymouth on the ſame adventure.

ſhould I recal to remembrance (if it can be forgotten), how cruelly his premature death extinguiſhed the fond expectations of his admiring friends, (formed both from the early dawn of his native elegance of mind, and from his acquired accompliſhments), and deſtroyed all their hopes of ſeeing in him, ſupported and extended, the reputation of a name, already endeared by innumerable ties to the votaries of virtue and literature?

——— Ingentem luctum ne quære tuorum:
Oſtendunt terris hunc tantum fata, neque ultra
Eſſe ſinunt. * * * Manibus date lilia plenis:
Purpureos ſpargam flores, animamque ———
His ſaltem accumulem donis, et fungar inani
Munere. ———

Virg. Æn. VI. 868 and 883.

venture. Capt. Wallis diſcovered, with many other iſlands, Otaheite,* which he named King George the Third's iſland, on Thurſday June 18. 1767. He left it July 27, and returned to England, Friday May 20. 1768. The obſervations of Capt. Carteret have but little connection with the ſubject of this diſſertation. On the 21ſt of November 1766, M. Bougainville, a French officer of diſtinguiſhed merit, ſailed from Breſt upon a ſimilar voyage. He touched at Otaheite on the 6th of April 1768, (which was long after Capt. Wallis's departure thence), refreſhed his crews in the very port which Capt. Carteret had lately left in New Ireland, and returned to Europe in March 1769, much about the ſame time as the Swallow ſloop, which he overtook almoſt in the Channel.

At the return of Capt. Wallis, the Royal Society of London preferred a memorial to the King, repreſenting the advantages, which would accrue to aſtronomical ſcience, if an accurate obſervation of the tranſit of Venus over the ſun in June 1769 could be taken in one of theſe iſlands in the South Seas. His Majeſty condeſcended to attend to their petition; and the Endeavour with Capt. Cooke, Meſs. Banks, Solander, and other ſelect philoſophers and natural hiſtorians on board, properly equipped and furniſhed, was on the 26th of Auguſt 1768 diſpatched to the South Seas.* This voyage having entirely anſwered the intention for which it was planned, and excited the curioſity of the nation; a ſecond expedition was in 1772 ſent into the ſame latitudes. The two ſhips employed in this voyage viz. the Reſolution and the Adventure, were under the command of Commodore Cooke. On board the Commodore's ſhip the Reſolution, were Dr Forſter, a gentleman previouſly to this expedition diſtinguiſhed by his ſkill in natural hiſtory, and his ſon, who had likewiſe given ſeveral proofs of a ſucceſsful attachment to the ſame purſuits. They were expreſſly commiſſioned in this voyage to collect, deſcribe, and draw objects of natural hiſtory. We are not therefore ſurprized to find, that Dr Forſter, in relating the events and diſcoveries of this expedition, has paid a particular attention to the health and diſeaſes of the ſailors; as well thoſe, which may be ſuppoſed to have originated from the climate, the voyage, and circumſtances of life, as thoſe that were introduced amongſt them by more direct contagion, and by communication with the natives of the iſlands.

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* The orthography of the name of this iſland has undergone many changes. It is called by Bougainville Taiti, by Dr Forſter O-Taheitee, by Capt. Wallis and Capt. Cook Otaheite, which mode of ſpelling I have adopted, except in the quotations from the other voyages.

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* They were ordered to proceed immediately to Otaheite, and after the aſtronomical obſervations ſhould be compleated, to proſecute the deſign of making diſcoveries in the ſouth pacific ocean. The Endeavour returned to England on the 12th of July 1771.

Before I make any remarks on this account, I ſhall give an abſtract of that part of his narrative, which relates to the ſubject of this diſſertation.

He begins his account at an earlier period than his own voyage, that his inveſtigation may be more accurately and ſatisfactorily conducted.

After deſcribing a diſeaſe reſembling the leproſy, which is ſometimes ſeen in theſe iſlands, he is led to ſpeak of the Venereal Diſorder, on which he makes the following obſervations. *

" When Capt. Cook came, in the year
" 1769, in the Endeavour to O-Taheitee, he
" found that half his crew, when he left
" the Society Iſles (of which O-Taheitee is
" the principal and moſt central) were in-

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* Obſervations made during a voyage round the world by *John Reinold Forſter*, LL. D. P. 488.

" fected with the Venereal Diſeaſe, * and it " was then ſuſpected, that M. Bougainville's " ſhips crew had communicated this diſeaſe. " Mr de Bougainville in his turn ſuſpects the " Engliſh in the Dolphin to have firſt intro- " duced it : † and the gentlemen in the Dol- " phin aſſert, that they never had one man " infected with the leaſt Venereal ſymptom, " whilſt they were at Taheitee or imme- " diately afterwards. ‡ When we came to " Q. Charlotte's ſound, in New Zealand, in " 1773, we had been out at ſea for at leaſt " five months ; none of our ſailors had any " ſymptom of this diſeaſe, which could hardly " lie dormant for ſuch a length of time: " ſince, from our leaving the Cape of Good " Hope, they had been eating ſalt-meat and " ſalt-pork plentifully, had no greens all " that time, had indulged freely in the uſe " of ſpirituous liquors, and were, during the " whole of the intermediate time, expoſed " to wet and cold, and all the rigors of the " climate ; circumſtances, that would ſoon " have accelerated the breaking out of the " diſtemper, and rendered it ſo virulent, that

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* See *Hawkeſworth*'s Voyages, Vol. II. p. 233.

† *Bougainville*'s Voyage, Eng. Tranſlation. p. 274 and 286.

‡ *Hawkeſworth*. Vol. I. p. 489, 490.

" they muſt have had recourſe to the aſſiſ-
" tance of the ſurgeon : yet, when we went
" out of Q. Charlotte's ſound, ſix months
" after leaving the Cape, a midſhipman on
" board the Adventure diſcovered that he
" had been infected by one of the New Zea-
" land females. In O-Taheitee, and the So-
" ciety-Iſles, we found in 1773, the females
" communicated this diſeaſe to ſeveral of
" our people, From the Friendly-Iſles no
" infection was either received or commu-
" nicated, becauſe the people who laboured
" under it were not allowed to have any
" commerce with the females of thoſe iſles.
" The crew left the Marqueſas and Eaſter
" Iſland without catching or communi-
" cating the evil, becauſe not a ſingle perſon
" was infected with it, either before we
" viſited thoſe parts, or for ſome time after
" we had left them. At Taheitee and the
" Society-Iſles, the infection came in 1774
" again into our ſhip ; and as we ſtaid only
" a few days at Namocka, I believe none
" either received or communicated it there.
" In the more weſtern iſles of Mallicollo,
" Tanna, and New-Caledonia our ſailors had
" no connection with the females ; but in
" New-Zealand the diſorder was again com-
" municated to our crew." Dr Forſter's

conclusion

concluſion of this ſtate of facts deſerves particular attention and examination: "So that "there is great reaſon to believe, that the "Venereal Diſeaſe has not been lately intro"duced into theſe iſles, but was known "there for a long time; eſpecially as Ohe"deeddee or Mahaine, the young man of "Borabora, who went with us in 1773 from "O-Raiedea, told us, that this evil was very "common in Borabora, where however, no "European ſhip had ever touched; nay he "informed us, that his own mother died of "this diſeaſe before the arrival of the Euro"peans in theſe iſles." He is therefore inclined to believe that the diſeaſe was not imported into, but originated in, theſe iſlands from libidinous exceſſes, and particularly from the promiſcuous and unreſtrained intercourſe of perſons afflicted with the leproſy in its various ſtages. Having advanced thus far, he ventures one ſtep farther, and endeavours to ſhew, that the diſorder in queſtion was not introduced into Europe by the ſailors of Columbus returning from the diſcovery of America; and that it did not even, as we generally ſuppoſe, make its firſt appearance in Europe about the period of that important event, but was long before diſtinctly marked and familiarly known. To eſtabliſh this doctrine he has no other re-ſource than the revival of that old opinion, (which has been already mentioned as far as it relates to the South Sea iſlands) that this diſeaſe may be generated in hot climates by libidinous exceſſes, eſpecially amongſt people, particularly liable to cutaneous, herpetic, and leprous affections. The arguments, which he adduces, have little novelty, but they are too curious to be overlooked: I ſhall therefore firſt produce them, and then venture a few remarks, firſt upon the general doctrine, and then as it more particularly applies to the ſtate of the new-diſcovered iſlands.

* "That the Venereal Diſeaſe is by no "means to be conſidered, as an evil imported into Europe from America, has "been ſufficiently proved, he ſays, by M. "Sanchez, a very able and learned phyſician, (who has been for ſome time in "Ruſſia. †) It appears from his enquiries, "that the Venereal Diſeaſe appeared ſo early "as in March, 1493, in Italy, and in Auvergne in France; at the very time when "Chriſtopher Columbus returned to Spain "from America; for he landed at Seville,

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* *Foſter*'s Obſervations, &c. p. 492. Note.

† *Diſſertation ſur l'origine de la Maladie Venerienne, Paris*, 1752, 12°. *Examen Hiſtorique ſur l'apparition de la Maladie Venerienne en Europe, Lisbonne, (Paris)* 1774.

" on the 15th of March, 1493,[‡] and in the " middle of April of the ſame year he arrived at court, which then reſided at Barcelona. From a book of Peter Pintor, a " Spaniſh phyſician, it appears that the Venereal Diſeaſe raged at Rome in March, " 1493; and it is likewiſe to be collected " from other writers, that about that time " this evil ſpread all over Italy in the form " of an epidemical diſtemper. Pacificus " Maximus, a poet, whoſe book was printed " at Florence, 1489, deſcribes, Lib. III. ad " priapum, the Venereal Diſeaſe in ſuch a " manner, that no doubt can be entertained " of its being known at that period of time. " In the church of St Maria del Popolo at " Rome, is a ſepulchral monument, erected " to the memory of Mario Alberti, *qui annum agens* 30 *peſte inguinaria interiit, anno* " 1485, about eight years before Chriſtopher " Columbus returned from his firſt voyage.[*] " The Jews, who were expelled from Spain, " brought the diſeaſe into Africa, according " to *Leo Africanus*.[†] And it was there for

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[‡] The earlieſt date of the arrival of Columbus in Europe is, Feb. 24. 1493, when he entered the Tagus. See *Robertſon*'s America 8°. Vol. I. p. 153.

[*] See *Viaggiana*, or detached remarks on the buildings, pictures, ſtatues, inſcriptions, &c. &c. in ancient and modern Rome, *London*, 1776.

[†] *Deſcriptio Africæ*, Lib. I. p. 86. edit. Elzevir *Lugdun. Bat.* 1632. 16mo.

" that reaſon called *Malum Hiſpanicum*, the " Spaniſh evil. But Mariana,[*] ſays expreſſly, that the order, for the expulſion " of the Jews from Spain, was given in " March 1492, and only four months were " allowed them, ſo that they were probably " gone in June 1492, before Chriſtopher " Columbus ſailed for the diſcovery of America. Nor are there teſtimonies wanting " that in times ſtill more remote, ſymptoms " of the Venereal Diſeaſe were well known: " Alfonſus I. King of Naples, died 1458, " of the gonorrhoea, or as Triſtano Caracciolo *de Varietate fortunæ*, expreſſes it, " *morbo inſuper immundo et pertinaci, involuntario ſcilicet inſenſibilique ſpermatis fluxu*. " Ladiſlas King of Naples likewiſe died " 1414, of an infection in his genitals, communicated to him by a girl, whom he " kept.[†] More inſtances, that the Venereal " Diſeaſe had been known amongſt the ancients, are to be found in Platner's Opuſcula.[‡] Petrus Martyr de Angleria mentions,[§] that Ario Barboſa, Profeſſor at

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[*] Lib. XXXIV. Cap. I. ad annum, 1492.

[†] *L'Art de verifier les dates*, p. 903. *Cardami*'s Chronicle from 1410, to 1494.

[‡] *Joh. Zach. Platneri Opuſc.* Tom. II. Prolus. III. *De Morbo Campano*. p. 21. Lipſiæ, 1748. 4°.

[§] Lib. I. Epiſt. 67, dated April 5. 1489.

"Salamanca, was ſeverely afflicted with the "*Bubas* or French diſeaſe. Laſtly in Muratori's Collection,* it appears from the "Chronicon Placentinum, that in the year "555, after Chriſt, there was an epidemical "peſtilential diſtemper in Italy, which among "other ſymptoms had theſe peculiar ones, "that the glands began to ſwell to the ſize "of a nut, particularly at the parts, which "modeſty bids conceal, which ſwelling was "followed by an intolerable heat, and that "thoſe afflicted with that dreadful evil died "in a day or two. All theſe arguments "encourage me to ſuppoſe, that the Venereal Diſeaſe was not uncommon in ancient "times; that it however broke out with "new rage about the year 1493, and that "fixing and attaching itſelf upon many "other epidemical diſtempers, it became "virulent, by being communicated by cohabiting with women. We need not wonder "therefore, that the diſeaſe ſhould have "made its appearance at Taheitee and its "neighbourhood, long before the arrival of "Europeans at their iſle."

In my obſervations upon this paſſage, I ſhall firſt make a few remarks relative to the ſubject in general, and then more particularly as it is connected with the medical hiſtory of the South Sea iſlands, not intending at preſent to go any farther than the bounds which a ſlight commentary will fairly admit.

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* *Muratori* Collectio Scriptorum Hiſtoriæ Ital. Tom. XVI. p. 554, 555.

To confute the whole of Dr Forſter's arguments is impoſſible; becauſe they can only be confuted by denying the veracity of his evidence, which perhaps can be done only by counter proofs more ſtrong and cogent. The moſt indiſputable however and the beſt eſtabliſhed of the facts adduced by him go no farther, than to ſuggeſt a doubt, whether the diſeaſe was originally imported from America by the ſailors of Columbus, but certainly do not prove, that it was not at that period a new diſeaſe, which made its appearance firſt about the year 1493, and was totally unknown to the ancients. It is obſervable, that the moſt authentic and creditable of theſe authorities being the date within the very ſmall compaſs of five or ſix years from 1488 to 1494. If the remainder of his hiſtories were given by medical perſons, or by perſons from their education and profeſſion qualified to ſpeak deciſively on ſuch a ſubject, more ſtreſs might be laid upon them: but they have been ſo ſatisfactorily confuted in the introductory Chapters of

Aſtruc's work, that they deſerve but little attention: a few however of the moſt remarkable facts alledged ſhall be preſently more particularly examined. As the diſorder, within ſo ſhort a time, (a few months in the beginning of the year 1493,) appeared in different quarters of Europe, at the moſt remote diſtance from each other, it has been argued, that it cannot be conceived that it originated in any one place, from whence it was ſpread by contagion from contact. The rapidity of its diſſemination indeed, or rather the univerſality of its prevalence at one and the ſame time, was conſidered by many contemporary writers, as altogether miraculous; and they imagined, that even the air was impregnated with noxious particles, which, received into the human body, became the ſemina morbi of this new and unparalleled affection. Thus Fracaſtorius, rejecting the opinion of the ſlow mode of its communication by the actual intercourſe of diſeaſed perſons, ſays, *

At verò, ſi ritè fidem obſervata merentur,
Non ita cenſendum: nec certè credere par eſt
Eſſe peregrinam nobis, tranſque æquora vectam
Contagem: quoniam imprimis oſtendere multos

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* *Siphylis*, Lib. I. V. 54.

Poſſumus, attactu qui nullius hanc tamen ipſam
Sponte ſua ſenſere luem, primique tulere.
Præterea et tantum terrarum tempore parvo
Contages non una ſimul potuiſſet obire.
Aſpice per Latii populos, quique herbida Sagræ
Paſcua, et Auſonios ſaltus, et Iapygis oræ
Arva colunt: ſpecta Tiberis quà labitur, et quà
Eridanus centum fluviis comitatus in æquor,
Centum urbes rigat, et placidis interfluit undis.
Uno, nonne vides, ut tempore peſtis in omnes
Sæviit? ut ſortem pariter tranſegimus unam?
Quinetiam externos eadem per tempora primum
Excepiſſe ferunt: nec eam cognovit Ibera
Gens prius, ignotum quæ ſcindere puppibus æquor
Auſa fuit; quam quos diſterminat alta Pyrene,
Atque freta, atque Alpes cingunt, Rhenuſque bicornis;
Quam reliqui, quos lata tenet gelida ora ſub arcto.
Tempore non alio, Pœni, ſenſiſtis, et omnes,
Qui lætam Ægyptum metitis, fæcundaque Nilo
Arva; et palmiferæ ſylvas tondetis Idumes.
Quæ quum ſic habeant ſeſe, nempe altius iſti
Principium labi, rerumque latentior ordo,
(Ni fallor) graviorque ſubeſt, et major origo.

All the traditions, collected by Dr Forſter, and intended to ſhew that this diſorder exiſted before the period abovementioned, and particularly that it was known to the ancients, are extremely equivocal, and, as I have already inſinuated, are moſt completely anſwered and explained in the introductory chapters of Aſtruc's work. It is indeed perfectly incredible, that a diſeaſe ſo dreadfully infectious, ſo diſtinctly characterized, and ſo peculiarly connected with ſome of the principal operations of human life, ſhould have eſcaped the notice not only of the ancient poets and hiſtorians, but of thoſe juſtly admired medical writers, whoſe remaining works evince a degree of attention, ſagacity, and accuracy in the inveſtigation and deſcription of the diagnoſtic ſymptoms of diſorders, attained by few modern phyſicians, except perhaps Sydenham and Boerhaave, with all the aids of an improved knowledge of nature, and a more perfect acquaintance with the laws of philoſophy and phyſiology.

It may be obſerved too, that moſt of the caſes, adduced from more modern writers to the ſame purpoſe, are taken from the obſcure works of perſons, probably very little qualified to give an opinion concerning the diagnoſis of a diſeaſe. A few obſervations on ſome of thoſe, mentioned by Dr Forſter, will illuſtrate this.

Little reliance can be had on the inſcription to the memory of Mario Alberti, *qui* *annum agens triceſimum peſte inguinaria interiit*, in the year 1485;* as there were, no doubt, both before and after the appearance of the Venereal Diſorder, many other complaints, which attacked the organs of generation in conſequence of thoſe libidinous exceſſes, in which the antient world indulged with equal if not greater freedom than the modern, as the writings of Suetonius, Tacitus, and Juvenal moſt amply teſtify. And affections of thoſe parts from other cauſes do even in theſe more enlightened days, when every ſymptom of the diſorder is ſo accurately known, often deceive the moſt experienced practitioners. How frequently has the nature of this complaint, when every art of concealment has been uſed, been at laſt detected only by the ſucceſs of a particular medicine, empirically adminiſtered? Beſides it may be added (which

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* Mr. *Swinburne*, in his account of the ſiege of Naples, and of the aſtoniſhment which prevailed amongſt the Neapolitans on the failure of their uſual miracle, the liquefaction of the blood of St Januarius, has ſome obſervations relative to this very inſcription, which ſtrongly confirm my opinion concerning the diſorder it alludes to, and alſo ſtrengthen the ſuppoſition, that the Venereal Diſeaſe was unknown before the period of that celebrated ſiege and the return of Columbus from America. That this diſeaſe was imported from the Eaſt is ſtill leſs probable, than that it was introduced from America: perhaps we muſt be obliged, with Fracaſtorius, to admit,

——— "altius iſti
Principium labi, rerumque latentior ordo,
(Ni ſallor) graviorque ſubeſt, et major origo."

"Were it becoming a reaſonable man to adopt the Neapolitan idea of St Januarius's blood being endowed with the gift of prophecy, one might ſuppoſe, that its obſtinate induration had not in view the mere event of the ſiege, but rather pointed to a cruel diſeaſe, which made its firſt appearance in our hemiſphere at that period and in that camp. It is ſaid, that this tremendous ſcourge of debauchery was firſt imported by the companions of Chriſtopher Columbus from the Charibbee iſlands, where it was an aboriginal malady; and that women infected by them were deſignedly ſent out of Naples to ſpread contagion amongſt the French, by whom the infernal poiſon was communicated to the reſt of Europe. But authors differ in their opinions concerning the introduction of this diſorder: ſome incline to give it an Eaſtern or Egyptian, not an American origin, and ground their notion upon the inſcription of a tomb in the church of S. Maria del Popolo at Rome." (Mr Swinburne's copy of this inſcription differs a little from that of Dr Forſter, and is probably more correct. *Marco Antonii equitis Romani filio ex Albertonum familia, corpore animoque inſigni, qui annum agens* XXX. *peſte inguinariâ interiit* an. ſalutis Chriſtianæ M CCCC LXXXV. die XXII. Julii hæredes B. M. P.)

"The difficulty lies, he adds, in proving this peſtis inguinaria to be really the diſeaſe in queſtion, and not a plague, that had its ulcer in the groin, as others have theirs under the arm, in the ſide, or elſewhere; for it is an obſervation made by many medical practitioners in the Levant, that each plague throws out its mortal tumour in one particular part of the body upon all patients. If this ſentiment of the lues coming from the Eaſt were incontrovertible, it would follow, that to all the accumulated horrors of tyranny, rapine, and murder, exerciſed by the Europeans upon the innocent Americans, we might add the introduction of a fatal and loathſome diſeaſe, which completed the deſolation of that continent, by deſtroying the few wretches their ſword had ſpared."

Swinburne's Travels in the two Sicilies, p. 93.

at the ſame time ſhews, that the epidemical peſtilence recorded in the Chronicon Placentinum can by no means be conſidered as a Venereal Complaint*), that ſwellings of the

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[*] Several of the Engliſh Chronologiſts and Chroniclers aſſert, that the plague raged in this Kingdom with dreadful violence in 1477 and 1499. Before I draw any inference from this obſervation, I will take the liberty of tranſcribing a paſſage from Dr *Mead*. † "The *Sweating Sickneſs* before hinted at, called *Sudor Anglicus* and *Febris Ephemera Britannica*, becauſe it was commonly thought to have taken its riſe here, was moſt probably of a foreign original: and though not the common *Plague* with *Glandular Tumors* and *Carbuncles*, yet a real peſtilence from the ſame cauſe, only altered in its appearance, and abated in its violence, by the ſalutary influence of our climate. For it preſerved an agreement with the common *Plague* in many of its *ſymptoms*, as exceſſive *faintings* and *inquietudes*, *inward burnings*, &c. &c. theſe ſymptoms being no where obſerved in ſo intenſe a degree, as here they are deſcribed to have been, except in the true *Plague:* and, what is much more, it was likewiſe a *contagious* diſeaſe.

The firſt time this was felt here, which was in the year 1485, it began in the army, with which King *Henry* VII. came from *France* and landed in *Wales* ‡: and it has been ſuppoſed by ſome to have been brought from the famous ſiege of *Rhodes* by the *Turks* three or four years before, as may be collected from what Dr *Keyes* ſays in one place of his treatiſe on this diſeaſe." §

The learned author's further obſervations on the diſtinguiſhing ſymptoms of this diſorder prove it to have been of the *peſtilential type*; and the particular æra of its appearance, concurring with the above-recited proofs, that the true Plague did appear in this kingdom very nearly at the ſame time, may reaſonably induce us to conclude, that

† *Mead* on the Plague, p. 72. edit. 9. 8°.

‡ Vid. Caium de Eph. Febre Britan. and Lord *Bacon*'s Hiſtory of *Henry* VII.

§ Page 162. edit. Lovan.

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glands in the axilla and inguen, and even of the teſticle itſelf, are not uncommon attendants of a great variety of epidemic fevers, and diſeaſes communicated by contagion, though not of a ſiphylitic nature. Of theſe Dr Fordyce * enumerates ſome inſtances in his Review of the Venereal Diſorder; and Dr Layard † in his Eſſay on the bite of the mad dog. It may be added, that of thoſe fevers which are commonly called peſtilential, eſpecially the true plague, glandular tumors in the axilla and inguen, particularly the latter, are eſteemed the diagnoſtic ſymptom. ‡ The intolerable heat attending, and the

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the kingdoms on the continent were more or leſs afflicted in the ſame manner, though it may not be eaſy to produce a poſitive proof of it, the attention of their hiſtorians being occupied in tracing the important revolutions, which then took place, or the calamities of war, which deſolated the earth, and more particularly the fertile provinces of Italy. Hence it may be reaſonably concluded, that the *Peſtis Inguinaria* in the text was more nearly allied to theſe peſtilential diſorders, than to the ſubject of our preſent diſquiſition.

* *Fordyce*'s Review of the Venereal Diſorder, Sect. 7.

† *Layard* on the Bite of the Mad Dog, p. 44.

‡ *Mead* on the Plague, p. 5. et ſeq.

Cullen's Noſolog. G. XXVII. Peſtis.

Sauvages, Noſolog. Cl. III. Ord. I. G. I. Peſtis. He expreſsly ſays, " Et ut character variolæ ex puſtulis, ita Peſtis character juxta omnes fere neotericos ex bubonibus deducendus eſt," and below, " Bubones ſunt glandulæ duræ, tumidæ, dolentes, ad ſuppurationem tarde vergentes, *ſæpius in inguinibus*, quandoque in cruris angulo, in axillâ, maxillâ, jugulo, pone aurem enati, unde evidens eſt parotidem a bubone non niſi ſitu diſcrepare."

the rapid fatality conſequent upon, theſe ſwellings, in the peſtilence alluded to by Dr Forſter, almoſt demonſtrably prove the complaint not to have been Venereal: for in the latter the inguinal ſwellings are ſeldom very rapid in their progreſs, in ſome caſes are indolent for many days; and as rarely is the diſorder ſuddenly fatal. *

That Alfonſus, King of Naples, died of a Venereal Gonorrhoea in the year 1485, is an aſſertion without any plauſible foundation of truth. A circumſtance of this nature, rendered notorious by the high rank of the victim, muſt have been ſo well known, that thoſe authors, who have treated of this Venereal ſymptom, could not have preſumed to aſſert, that it did not make its appearance 'till the more common ſymptoms of the Lues had been well known for more than twenty years; nay, till the virulence, with which they had made their firſt invaſion, was conſiderably mitigated and corrected. † Carra-

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* See *Aſtruc*, De Morb. Ven. Lib. III. Cap. V. Sect. 1. De Definitione, Deſcriptione, et Differentiis Bubonum Venereorum. *Van Swieten*, Comment. in Boerhaavii Aphoriſma, 1448.

† *Aſtruc*, De Morb. Ven. Lib. I. Ch. XII. Sect. 4. et, Lib. V. De Scriptoribus Sæculi XVI, de Jacobo a Bethencourt. *Van Swieten*, Comment. in Boerhaavii Aphor. 1447.

ciolo only ſays, that Alfonſus was deſtroyed *Morbo immundo, involuntario ſcilicet et inſenſibili ſpermatis fluxu.* But this proves no more, than that his diſorder was a ſeminal weakneſs, a ſpecies of the Tabes Dorſalis or Gonorrhoea Ονειρογονος.[‡] The Venereal Gonorrhoea is neither Spermatis fluxus, nor is it a diſcharge without pain, inſenſibilis.

Even this account of the cauſe and manner of this Prince's death is after all very weakly founded. It muſt be owned, that no one, who plunges into libidinous luxury is exempt from its debilitating effects, which generally lay the foundation of corporeal and mental imbecility, and very often cut ſhort the thread of life: whereas Alfonſus lived to a conſiderable age, paſſed no ſmall part of his life in the active engagements of the camp and the field, and in his declining years governed his united dominions of Arragon, Sicily, and Naples with ſuch prudence and proſperity, as to have attained from hiſtorians the title of great. Nor do they in general make any mention, that he was ſubject to any natural or acquired infirmity of body or mind.[*]

[‡] *Sauvages*, Noſolog. Cl. IX. Ord. III. Gen. XXX. Sp. 3. et Cl. X. Ord. I. G. I. Sp. 1.

[*] *Swinburne*'s Travels through the two Sicilies, p. 22.

That Ladiſlas, King of Naples, died of a Venereal Diſorder is not leſs diſputable, than the former aſſertion. In the account given of him in the Dictionnaire Hiſtorique Portatif, it is ſaid, "Il mourut a Naples le "16 Août 1414, à 38 ans, d'un poiſon, que "la fille d'un medecin lui avoit donné a "Perouſe," a mode of expreſſion extremely inaccurate, and not to be hazarded by a biographer, if he really died of the Venereal Diſorder. Had that been the caſe, the writer would have been either more or leſs explicit, than he is. If he was willing to conceal the misfortune or the diſgrace of the king, he was not required to ſay ſo much: if that prince really died of this diſorder, and the author was deſirous of perpetuating the memory of that event, he would not have expreſſed himſelf in terms ſo ambiguous.

But the hiſtory of Ladiſlas ſupports the author's hypotheſis with more plauſibility than that of Alfonſus; becauſe hiſtorians agree, that the Ladiſlas delivered from enemies at home, and an overmatch for thoſe abroad, gave himſelf up to pleaſure, and ſhortened his days by exceſs of debauchery. It is moſt probable however, that the prejudicial conſequences of theſe exceſſes led him to have recourſe to medicine, and to entruſt himſelf to the care of every empiric, who was baſe enough to flatter him with the perfect reſtoration of his debilitated frame; and that to one or more of the pretended reſtoratives, thus adminiſtered by the hand of empiriciſm, he finally became a victim.

Having premiſed theſe few obſervations, I ſhall now return more particularly to the account of the diſorder in the South Sea iſlands. I have already mentioned, that Dr Forſter inſinuates, not indirectly, that the Venereal Diſorder was known at Otaheite, &c, before any European ſhips ever touched at thoſe iſlands. But Capt. Cook in his account of the ſame voyage ſpeaks a very different different language. "They call the Venereal "Diſeaſe *Apa-no-Pretane* (Engliſh Diſeaſe), "though they ſay to a man, that it was "brought to the iſland by Bougainville; but "they thought he alſo came from *Pretane*, "as well as every other ſhip, which has "touched on the iſland. Were it not for "this aſſertion of the natives, and none of "Capt. Wallis's people being affected with "the Venereal Diſeaſe, either while they "were at Otaheite, or after they left it, "I ſhould have concluded, that long before "theſe iſlanders were viſited by Europeans, "this, or ſome diſeaſe which is near a-kin

" to it, had exiſted among them. For I " have heard them ſpeak of people dying of " a diſorder, which we interpreted to be " the pox, before that period. Theſe people " are, and were before Europeans viſited " them, very ſubject to ſcrophulous diſor- " orders, ſo that a ſea-faring man might " eaſily miſtake one diſorder for another." * As the inhabitants of theſe iſlands had no name for this diſeaſe before the arrival of the European ſhips, which may be fairly inferred from their calling it afterwards *Apano-Pretane, the Britiſh Diſeaſe*, is it not very improbable, that the diſorder exiſted at all amongſt them before that period? This name ſeems to have been given by the natives to this diſeaſe during the interval between the firſt and ſecond voyages of Capt. Cook; for it appears very plainly by Hawkeſworth's account, † that they had no name at all for it at the time of the firſt voyage, and diſtinguiſhed it only by a metaphorical expreſſion of the ſame import as rotteneſs, but of a more extenſive ſignification. They deſcribed, in the moſt pathetic terms, the ſufferings which the *firſt* victims to its rage endured.

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* Capt. *Cook*'s Account of the Voyage of the Reſolution and Adventure, &c. &c. Vol. I. Ch. XIV. p. 181.

† See *Hawkeſworth*'s Voyages, Vol. II. p. 233.

It ſpread, they ſaid, an univerſal terror and conſternation among the inhabitants, ſo that the ſick were abandoned by their neareſt relations, leſt the calamity ſhould become univerſal by contagion, and were left to periſh alone in ſuch miſery, *as till then had never been known among them.*

Do not theſe accounts, eſpecially thoſe expreſſions, which are diſtinguiſhed by italic characters, ſufficiently ſhew, that the diſeaſe was not indigenous in theſe iſlands, but communicated to them by the intercourſe of ſtrangers, whoſe viſit and its effects were freſh in the memory of the perſons then living? Are not we therefore juſtified in adopting the following concluſion, ſuggeſted by an induſtrious and well inſtructed, though anonymous, writer on theſe ſubjects? "If "an European ſhip (be it Mr de Bougain"ville's or the Dolphin, Capt. Wallis's, in "ſome meaſure contributing) did commu"cate this baneful diſeaſe to a healthy race "of people, and this not to one iſland only, "but ſpreading it among ſeveral, it is a con"ſequence incidentally ariſing from Euro"pean curioſity and thirſt after knowledge, "which cannot be too-much regretted; and "will entail a miſery upon theſe Indians, "ſo dreadful, that all the attempts to enrich

" them with new ſpecies of vegetables and
" animals cannot in any degree compenſate
" for, even if ſuch endeavours had proved
" as effectual, as they were well intended."*

Upon the whole ſtate of this argument, I am induced to believe, that Dr Forſter deſirous of freeing his European brethren from the ignominy of having introduced this calamity into the South Sea iſlands, collected every argument which ingenuity could ſuggeſt to perſuade himſelf and others: he hoped particularly to ſecure this point, if by reviving the old and almoſt obſolete doctrines he could in any degree ſhew, that the diſeaſe may be generated in a hot climate by the promiſcuous and exceſſive intercourſe of perſons afflicted with leprous and other cutaneous affections; and could prove that it was neither introduced into Europe by the ſailors of Columbus in 1493, nor entailed at that period by a peculiar exertion of the divine vengeance againſt the multiplied crimes of the human race, but exiſted long before: for then, it might be inferred, that the ſame cauſes would produce the ſame effects in theſe iſlands, and that neither modern times nor modern travellers deſerve the accuſation of introducing it there.

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* *New Diſcoveries* concerning the World and its inhabitants, &c. &c. London, 1778. 8°. Johnſon, Page 62.

I muſt acknowledge, that his arguments have not brought conviction to my mind; though I have not the preſumption to ſuppoſe, that the obſervations, which I have myſelf made, will be thought ſufficient to ſatisfy thoſe, who may have adopted his opinion. As different ſentiments on ſubjects of ſcience muſt unavoidably ſubſiſt amongſt men, to whom the truth can be only revealed by ſlow and gradual inquiries; it is by a candid and diſpaſſionate examination only, that we can hope to attain this grand object of all literary purſuits: and he who has laboured to promote that great cauſe, even though his aſſiſtance may not be ſenſibly felt, may at leaſt indulge himſelf with the reflection, that in endeavouring to be uſeful, he has not totally miſemployed his time.

FINIS.

B L

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